NUEXCO

Monthly Report

January 1991 Number 269

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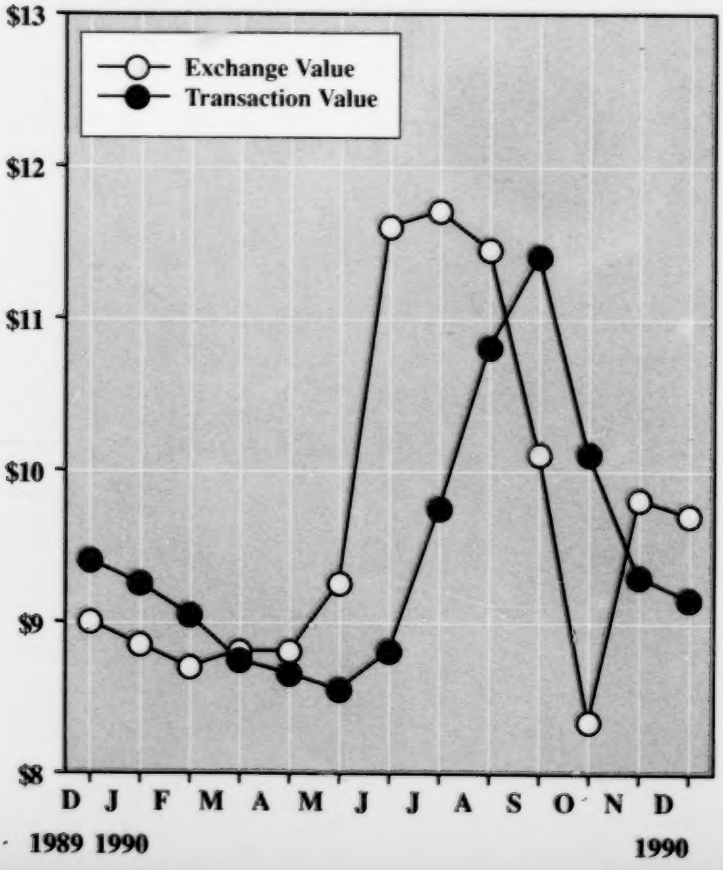

NUEXCO

International Headquarters

Oren L. Benton – Chairman and Chief Executive Officer
Earl E. Hoellen – President and Chief Operating Officer

Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202 USA

Telephone: (303) 899-4500
Telefax: (303) 899-4555
Telex: 450202 (NUEXCO)

Service Locations

DENVER, COLORADO, USA

Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202
Telephone: (303) 899-4500
Telefax: (303) 899-4555
Telex: 450202 (NUEXCO)

WASHINGTON, D.C., USA

11 Dupont Circle, Suite 505
Washington, D.C. 20036
Telephone: (202) 328-9250
Telefax: (202) 328-6699
Telex: 451691 (NUEXCO DC)

ZURICH, SWITZERLAND

Leberngasse 15
4603 Olten
Switzerland
Telephone: (41-62) 320032
Telefax: (41-62) 321450
Telex: 981600 (NUXCH)

SAN FRANCISCO, CALIFORNIA, USA

Building 1, Suite 105
3000 Sand Hill Road
Menlo Park, California 94025
Telephone: (415) 854-1510
Telefax: (415) 854-2115
Telex: 470674 (NUEXCO SF)

HONG KONG

1403 Shui On Centre
6-8 Harbour Road, Wanchai
Hong Kong
Telephone: (852) 865-1418
Telefax: (852) 865-2721
Telex: 67206 (CNITC)

GENEVA, SWITZERLAND

13 chemin du Levant
01210 Ferney-Voltaire
France
Telephone: (33-50) 428035
Telefax: (33-50) 428526
Telex: 385288 (NUEXCO F)

Service Entities

NUEXCO Trading Corporation	Earl E. Hoellen, President
NUEXCO Information Services Company	Earl E. Hoellen, President
NUEXCO Transportation & Services Company ("NuTranS")	Robert L. Bovey, President
NUEXCO Asia, Limited	Gerald L. Murdock, Managing Director
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Managing Editor:
R. Wesley Miller

Director-Market Analysis:
Treva E. Klingbiel

Editor:
France Addington-Lee

Assistant Editor:
Kenten D. Lindberg

Editorial Assistant:
Alan L. Wolcott

Supply Analysis:
Thomas C. Pool

Demand Analysis:
John M. Vallance

Market Analysis:
David S. Schramm

Research Services:
Carolyn B. McCants

Subscription Services:
Lori A. Mattics

Washington Focus:
Linda L. Gunter

Published by:
NUEXCO
Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202
Telephone: (303) 899-4500
Telefax: (303) 899-4555
Telex: (303) 450202 (NUEXCO)

Other NUEXCO Publications:
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International Directory of Uranium Producers (IDUP)

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To Our Readers

An updated, cumulative 12-year index to NUEXCO Monthly Report articles will soon be available and will be mailed to all subscribers of the Monthly Report. This convenient reference lists and cross-references all of the Monthly Report articles by subject, as well as speeches, essays, and authored articles for all Reports from 1979 through 1990.

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Market Values Summary

NUEXCO Market Values	This Report December 31, 1990	Last Report November 30, 1990	12 Months Ago December 31, 1989
EXCHANGE VALUE [1]	**$9.70**/lb equivalent U_3O_8	$9.80	$9.00
UF_6 VALUE [2]	**$28.75**/kg U as UF_6	$28.75	$26.50
LOAN RATE [3]	**3.5%**/annum	3.5%	3.5%
CONVERSION VALUE [4]	**$1.45**/lb U as UF_6	$1.45	$1.65
SWU VALUE [5] **(0.3 % tails assay)**	**$51**/SWU	$51	$54
TRANSACTION VALUE [6]	**$9.15**/lb equivalent U_3O_8	$9.30	$9.40
Transactions	19	16	21
Months	3	3	3
Millions of Pounds	3.1	3.0	4.2

DEFINITIONS

[1] The **Exchange Value** is NUEXCO's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.

[2] The **UF_6 Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.

[3] The **Loan Rate** is NUEXCO's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.

[4] The **Conversion Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.

[5] The **SWU Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of enrichment services could be concluded as of the date indicated.

[6] The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:

a) Transactions closed within the previous three month period for which delivery is scheduled within one year of the transaction date;

b) At least ten transactions;

c) Transactions involving a sum total of at least 2 million pounds equivalent U_3O_8.

DERIVATIONS AND COMMENTS

- All **Market Values** are expressed in terms of US$.
- All **Market Values** are based on:
  - Data from recently completed transactions.
  - Data from pending transactions.
  - Firm bids to buy or borrow, and firm offers to sell or lend.
  - Prices purchasers or rates borrowers have expressed a willingness to pay, but for which NUEXCO is not aware of firm bids to buy or borrow and prices sellers or rates lenders have expressed a willingness to accept, but for which NUEXCO is not aware of firm offers to sell or lend.
- Prices associated with deliveries under old or renegotiated, contracts or other than arm's-length transactions, are not included in the determination of these **Market Values**.
- In the determination of **Market Values**, NUEXCO does not consider charges for transportation other than that customarily provided by suppliers.
- The prices of services or materials delivered under long-term contracts with primary suppliers are not considered in the determination of the **Market Values**.
- In the determination of the **SWU Value**, NUEXCO converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the NUEXCO **Exchange Value** and **Conversion Value** determined as of the same date.
- In calculating the **Transaction Value**, NUEXCO does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future **Exchange Values** or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it can not currently be determined.
- The sample time for the **Transaction Value** is extended as necessary to satisfy the minima for the number of transactions and quantity of material. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

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DECEMBER MARKET REVIEW

(as of December 31, 1990)

OVERVIEW

At the close of 1990, the Exchange Value slipped $0.10 from the end of November, to $9.70 per pound U_3O_8, while the UF_6 Value was unchanged at $28.75 per kgU as UF_6. Compared to the level of activity earlier in the year, December was a slower month with just over one million pounds equivalent U_3O_8 changing hands. The holiday season, low demand at year-end, and uncertainty in the market all contributed to the lower volume. However, for the year, spot market volume reached a record high of over 40 million pounds equivalent U_3O_8 (**Table 1**).

The Loan Rate, Conversion Value, and SWU Value all remained unchanged at 3.5 percent, $1.45 per pound U as UF_6, and $51 per SWU, respectively. These markets were also quieter in December, each having only one transaction reported.

NATURAL URANIUM AND CONVERSION

The uranium market softened somewhat and the **Exchange Value** declined ten cents, to **$9.70** per pound U_3O_8. Throughout December, some sellers were hesitant to offer prices above the November 30 Exchange Value, concerned that higher prices would draw additional sellers into the market. Several suppliers had indicated during November and December that they would consider reentering the market as sellers if prices rose above ten dollars per pound. But, the resistance of buyers to higher prices limited the entrance of new sellers. Several discretionary buyers withdrew from the market during December in anticipation of lower prices in the future. At least three buyers chose not to purchase any material after publicly soliciting offers.

Five concentrates sales were reported for December totalling over 900 thousand pounds equivalent U_3O_8 for delivery during first quarter 1991. Prices ranged from slightly above the November 30 Exchange Value early in the month, to levels at or near the December 31 Exchange Value. Purchases by a single intermediary and two producers accounted for a large majority of the material sold in December. Four of the buyers are located in the USA, while sellers are from Europe and the USA.

* * *

The **UF_6 Value** was unchanged at **$28.75** per kgU as UF_6. This is the first time since April 1990 that the UF_6 Value has not changed; notable because the past six to eight months have been so volatile. During December, most buyers were willing to accept either concentrates or UF_6, evaluating the economics of each offer, based upon their judgments of the uranium and conversion markets, and purchasing U_3O_8 or UF_6 accordingly. Just as with concentrates, buyers usually had multiple offers from which to choose, even for small quantities. If offered prices failed to meet the buyer's expectations, they simply elected to postpone their purchases, confident that prices would be lower in the future.

Three natural UF_6 sales were reported. Three US buyers purchased nearly 200 thousand pounds equivalent U_3O_8. All three sales called for delivery in February 1991 from the intermediary sellers. The sales were concluded at prices that ranged from below the prevailing UF_6 Value for a small quantity, to prices at or near the December 31 UF_6 Value for a larger delivery.

Table 1
NEAR-TERM URANIUM SALES SUMMARY

	December 1990		Year-to-Date	
	No. of Sales	Volume[1]	No. of Sales	Volume[1]
Concentrates	5	0.9	68	23.9
Natural UF_6	3	0.2	36	9.7
EUP	1	≤0.1	13	7.0
Total	**9**	**1.2**	**117**	**40.6**

[1] million pounds equivalent U_3O_8

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Table 2
NEAR-TERM SUPPLY/DEMAND SUMMARY

	Active Supply [1]	Active Demand [1]
• Natural Uranium [2] (thousand lbs equivalent U_3O_8)	4,400	1,895
• Supply/Demand Ratio:	2.3	
• Loan (thousand lbs equivalent U_3O_8)	9,025	0
• Conversion (thousand lbs U as UF_6)	700	465
• SWU (thousand SWUs)	200	105

[1] Supply and demand tables in the Market Review section of this Report provide details for each category.
[2] Includes concentrates and hexafluoride.

The **Transaction Value** declined $0.15, to **$9.15** per pound U_3O_8 based on 19 transactions over 3 months involving 3.1 million pounds equivalent U_3O_8. Although December's sales help boost the average, its low volume was not enough to compensate for the loss of September's higher-priced sales from the calculation. Consequently, the Transaction Value dropped slightly.

* * *

Active uranium supply dropped from 4.7 million pounds to **4.4** million pounds equivalent U_3O_8 (**Table 2**). **Active uranium demand** increased by 100 thousand pounds, to **1.9** million pounds equivalent U_3O_8. The **supply/demand ratio** slipped to **2.3**. These slight movements of supply and demand must be kept in perspective. They are only minor fluctuations when compared to the magnitude and unsettled state of the market's oversupply situation. Short-term supply/demand imbalances may affect an individual transaction, but until government stockpiles and excess utility and producer inventories are drawn down, substantial price increases will not be sustainable and it will remain a buyer's market.

Only one sale was reported in the **long-term natural uranium market**. Earlier in 1990, an Asian utility purchased several million pounds of concentrates from a producer for delivery during the period 1992 to 2001. Four utilities, two US and two European, continue to evaluate long-term offers. All four utilities received a large number of offers with a wide variety of pricing terms. The utilities are expected to make their purchase decisions during early 1991, and will likely conclude contracts with excellent terms due to the extraordinary competition among sellers.

* * *

The **Loan Rate** remains unchanged at **3.5** percent per annum. One December UF_6 loan was reported. An intermediary borrowed over 250 thousand pounds equivalent U_3O_8 from a US utility. Loan supply remains in excess of 9 million pounds equivalent U_3O_8 while no inquiries to borrow are reported.

* * *

The **Conversion Value** also remains at the same level, **$1.45** per pound U as UF_6, unchanged since February 28, 1990. One sale was reported, in which a US utility purchased conversion for over 200 thousand pounds U from an intermediary at a price near the December 31 Conversion Value for delivery during 1991.

ENRICHMENT SERVICES AND ENRICHED URANIUM PRODUCT

The **SWU Value** remained at **$51** per SWU for the third consecutive month. Secondary enrichment market activity was light in December with no real pressure upward or downward on the SWU Value. Only one transaction was reported, in which a fabricator purchased a small quantity of enriched uranium product (EUP) from an intermediary. One buyer continues to evaluate offers on a small quantity of EUP. A few additional SWU buyers are expected to request offers during first quarter 1991.

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MARKET REVIEW

Additionally, as the enrichment market evolves, following in the path of the natural uranium market, market participants are beginning to examine loan opportunities involving enriched uranium. Both borrowers and lenders are starting to explore opportunities to utilize some of the existing inventories of EUP. ■

NOTICE

Beginning with this report, please note that the South Korean Won and Taiwan Dollar have been added to the Market Values Expressed in Selected Currencies tables.

In the December Monthly Report (#268), the calculation of the Market Values in Swedish Krona in the Selected Currencies tables was incorrect. The correct values are shown in this month's tables under the column labled *Last Month/November 30, 1990.*

Table 3
ENRICHMENT PRICES
(December 31, 1990)

Prices	This Month Report 269	Last Month Report 268	12 Months Ago Report 257
NUEXCO SWU Value ($US per SWU)	51	51	54
US DOE SWU prices: ($US per SWU)			
USEC	117.85[1]	117.85[1]	117.85[1]
AFC	153.00[3]	153.00[3]	153.00[3]
Requirements	157.00[3]	157.00[3]	157.00[3]
Incentive Price (IP2)[4]	100.60[4]	100.60[4]	90.00[5]
Calculated worth of enriched UF_6[6]: ($US per KgU as UF_6)			
2.0 w/o U_{235}	205	206	204
2.5 w/o U_{235}	282	284	283
3.0 w/o U_{235}	362	364	363
3.5 w/o U_{235}	444	446	446
4.0 w/o U_{235}	526	528	529
4.5 w/o U_{235}	609	612	614

[1] Effective 10/1/89 to 9/30/91.
[2] Effective 10/1/87 to 9/30/89.
[3] Effective since 10/1/84.
[4] IP2: Effective 10/1/90 to 9/30/91, for up to 30% of annual requirements.
[5] Used Incentive Price IP1 – effective 10/1/86 to 9/30/90, for up to 30% of annual requirements.
[6] Calculated using the NUEXCO Exchange Value, Conversion Value, SWU Value and 0.30 w/o tails assay.

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RECENT TRANSACTIONS

Uranium Sales[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8s)	Price Within Percentage Range[2] of Current Exchange or UF_6 Value	Buyer	Seller	Remarks
5000	1991	Less Than 50	Below 90	Utility	Intermediary	UF_6
5005	1991	101-300	98-102	Producer	R	
5006	1991	Less Than 50	90-97	Utility	Intermediary	UF_6
5012	1992-2001	1,001-3,000	R	Utility	Producer	Occurred Earlier in 1990
5015	1991	101-300	98-102	Intermediary	Intermediary	UF_6
5016	1991	50-100	98-102	Intermediary	Intermediary	
5017	1991	Less Than 50	R	Producer	Intermediary	Market Related Pricing
5018A	1991	Less Than 50	R	Fabricator	Intermediary	Contained in EUP
5020	1991	101-300	98-102	Intermediary	Intermediary	
5022[3]	1991	301-600	R	Intermediary	R	

R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.

[2] The ranges *Below 90, 90-97, 98-102, 103-110, Above 110*, represent percentages (rounded to whole numbers) of the appropriate current Exchange Value or UF_6 Value. The endpoints of each range are included within that range.

[3] NUEXCO learned of this December transaction after December 31, 1990, therefore this transaction was not included in the data presented in the Monthly Market Activity Summary that was transmitted on January 1, 1991.

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RECENT TRANSACTIONS

Natural Uranium Loans[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8)	Price Within Percentage Range[2] of Current Loan Rate	Borrower	Lender	Remarks
5019	1991	101-300	98-102	Intermediary	Utility	UF_6

Conversion Sales[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds of U equivalent)	Price Within Percentage Range[2] of Current Conversion Value	Buyer	Seller	Remarks
5008	1991	101-300	98-102	Utility	Intermediary	

Enrichment Sales[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity[3] (thousand SWU)	Price Within Percentage Range[2] of Current SWU Value[4]	Buyer	Seller	Remarks
5018B	1991	Less Than 50	R	Fabricator	Intermediary	Contained in EUP

R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.

[2] The ranges *Below 90, 90-97, 98-102, 103-110, Above 110*, represent percentages (rounded to whole numbers) of the appropriate current Market Value. The endpoints of each range are included within that range.

[3] If tails assay is unknown or unspecified, NUEXCO's calculation of SWU quantity assumes 0.30 w/o tails assay.

[4] Prices are usually normalized to 0.30 w/o tails assay. When prices and SWU values are expressed as discounts from a reference price (e.g., X dollars less than DOE's USEC base price at time of delivery), the percentage price range is based on the discounted prices, not on the reference price.

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SUPPLY AND DEMAND

Uranium Supply

NUEXCO Project Number	Quantity (Thousand Pounds equivalent U_3O_8) Spot or Near-term[1]	Intermediate or Long-term[2]	Delivery Period	Remarks
Available for Sale:				
ACTIVE				
90-1078A*	700	1,045 per year	1991-1993	UF_6e
90-1227	500	—	1991	
90-1231	500	500 per year	1991-1995	
90-1249	700	—	1991	
90-7001	2,000	1,000 per year	1991-1995	
Total	**4,400**			
INACTIVE	**4,450**			
Available for Loan:				
ACTIVE				
88-1182	4,400	—	—	U_3O_8/UF_6
90-1016	1,000	—	—	U_3O_8
90-1108	1,000	—	—	U_3O_8
90-1180	525	—	—	U_3O_8
90-1230	1,000	—	—	U_3O_8
90-1260	1,000	—	—	UF_6
90-1275	100	—	—	U_3O_8
Total	**9,025**			
INACTIVE	**1,000**			

*New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes material deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: *none*
Active Projects removed since last month: 90-1208

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MARKET REVIEW

SUPPLY AND DEMAND

Uranium Demand

NUEXCO Project Number	Quantity (Thousand Pounds equivalent U_3O_8) Spot or Near-term[1]	Intermediate or Long-term[2]	Delivery Period	Remarks
Inquiries to Purchase:				
ACTIVE				
90-1100A	45	—	1991	UF_6e
90-1235B	250	—	1991	
90-1239A*	160	—	1991	UF_6e
90-1289*	210	—	1991	
90-1292*	50	—	1991	
90-1293*	200	—	1991	
90-1302*	980	—	1991-1992	
90-1170	—	290	1992-1996	
90-1226	—	1,045 per year	1992-1996	UF_6
90-1240	—	260 per year	1994-1996	U_3O_8/UF_6
90-1254A	—	250 per year	1993-1996	U_3O_8/UF_6
90-1256	—	500 per year	1994-1998	U_3O_8/UF_6
90-1291*	—	100	1991-1995	
Total	**1,895**			
INACTIVE	**2,820**			
Inquiries to Borrow	*No inquiries to borrow are reported*			

* New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes material deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: 90-1267, 90-1274, 90-1276
Active Projects removed since last month: 90-1182, 90-1205, 90-1271, 90-1277, 90-1281, 90-1284

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SUPPLY AND DEMAND

Conversion Supply And Demand

NUEXCO Project Number	Quantity (Thousand Pounds U as UF6) Within 3 Years [1]	Beyond 3 Years [1]	Delivery Period	Remarks
Available for Sale:				
ACTIVE				
91-7000	300	—	1991	
91-7001	400	—	1991	
Total	**700**			
INACTIVE	*None reported*			
Inquiries to Purchase:				
ACTIVE				
90-1259	210	—	1991	
90-1306*	255	255 per year	1991-2002	
90-1254C	—	210	1993-1996	
Total	**465**			
INACTIVE	*None reported*			

* New or revised since last month.

[1] Measured from the date of this Report.

Active Projects reclassified as Inactive since last month: *none*
Active Projects removed since last month: 90-1264, 90-1282

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SUPPLY AND DEMAND

SWU Supply And Demand

NUEXCO Project Number	Quantity (Thousand SWUs) Spot or Near-term [1]	Intermediate or Long-term [2]	Delivery Period	Remarks
Available for Sale				
ACTIVE				
90-1078B	200	435 per year	1991-93	UF6e
90-7000	—	1,000	1991 on	
Total	**200**			
INACTIVE	**650**			
Inquiries to Purchase				
ACTIVE				
90-1100B	15	—	1991	UF6e
90-1224	40	100 per year	1991-1995	
90-1239B*	50	—	1991	UF6e
88-1061	—	500	1991-1995	
90-1076	—	350 per year	1992-1998	
90-1094	—	500	1992-2000	
90-1144	—	60 per year	1992-2001	
90-1181	—	600	1996-2003	UF6e
90-1196	—	60 per year	1995 on	
90-1301*	—	1,000 per year	1995-2000	
Total	**105**			
INACTIVE	**150**			

* New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes SWU deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: 88-1006, 90-1225

Active Projects removed since last month: *none*

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MARKET VALUES EXPRESSED IN SELECTED CURRENCIES

Exchange Value[1]

Country (currency)	per lb equivalent U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)
Australia (dollar)	12.58	12.70	11.33	32.71	33.02	29.44
Belgium (franc)	299.57	304.73	319.60	778.81	792.22	830.89
Canada (dollar)	11.25	11.41	10.41	29.25	29.66	27.07
EC (ecu)	7.17	7.11	7.48	18.64	18.48	19.43
Finland (markka)	35.13	35.32	36.60	91.34	91.82	94.38
France (franc)	49.32	49.81	52.08	128.23	129.49	135.40
Germany (mark)	14.50	14.76	15.23	37.70	38.38	39.60
Italy (lira)	10,922	11,088	11,390	28,395	28,828	29,610
Japan (yen)	1,309	1,307	1,296	3,402	3,399	3,370
Netherlands (guilder)	16.35	16.66	17.17	42.50	43.30	44.64
So. Africa (comm. rand)	24.88	24.55	22.83	64.68	63.82	59.34
So. Korea (won)	6,931	7,002	6,639	18,018	18,204	17,259
Spain (peseta)	927.79	935.92	985.11	2,412	2,433	2,561
Sweden (krona)	54.56	55.21	55.83	141.83	143.54	145.15
Switzerland (franc)	12.38	12.57	13.90	32.18	32.69	36.13
Taiwan (dollar)	258.36	262.09	254.41	671.69	681.37	661.42
UK (pound)	5.04	5.06	5.62	13.10	13.15	14.61
US (dollar)	9.70	9.80	9.00	25.22	25.48	23.40

Transaction Value[1]

Country (currency)	per lb equivalent U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)
Australia (dollar)	11.87	12.05	11.83	30.85	31.34	30.75
Belgium (franc)	282.58	289.18	333.81	734.65	751.80	867.82
Canada (dollar)	10.61	10.83	10.88	27.59	28.14	28.27
EC (ecu)	6.76	6.74	7.81	17.59	17.53	20.30
Finland (markka)	33.14	33.52	37.92	86.16	87.14	98.58
France (franc)	46.53	47.27	54.40	120.96	122.89	141.42
Germany (mark)	13.68	14.01	15.91	35.56	36.42	41.36
Italy (lira)	10,303	10,523	11,896	26,785	27,357	30,926
Japan (yen)	1,234	1,241	1,354	3,209	3,225	3,519
Netherlands (guilder)	15.42	15.81	17.93	40.09	41.09	46.62
So. Africa (comm. rand)	23.47	23.30	23.84	61.01	60.57	61.98
So. Korea (won)	6,538	6,645	6,300	16,996	17,275	16,379
Spain (peseta)	875.18	888.17	1,029	2,275	2,309	2,675
Sweden (krona)	51.46	52.39	58.31	133.79	136.21	151.60
Switzerland (franc)	11.68	11.93	14.52	30.35	31.02	37.74
Taiwan (dollar)	243.71	248.72	241.43	633.60	646.61	627.67
UK (pound)	4.75	4.80	5.87	12.35	12.48	15.26
US (dollar)	9.15	9.30	9.40	23.79	24.18	24.44

[1]Calculated using currency exchange rates published in *The Wall Street Journal* on the last working day of the month.

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MARKET REVIEW

MARKET VALUES EXPRESSED IN SELECTED CURRENCIES

Conversion Value[1]

Country (currency)	per lb U as UF_6			per kg U as UF_6		
	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)
Australia (dollar)	1.88	1.88	2.08	4.15	4.14	4.58
Belgium (franc)	44.78	45.09	58.59	98.72	99.40	129.18
Canada (dollar)	1.68	1.69	1.91	3.71	3.72	4.21
EC (ecu)	1.07	1.05	1.37	2.36	2.32	3.02
Finland (markka)	5.25	5.23	6.66	11.58	11.52	14.67
France (franc)	7.37	7.37	9.55	16.25	16.25	21.05
Germany (mark)	2.17	2.18	2.79	4.78	4.82	6.16
Italy (lira)	1,633	1,641	2,088	3,599	3,617	4,603
Japan (yen)	195.60	193.44	237.62	431.23	426.45	523.85
Netherlands (guilder)	2.44	2.46	3.15	5.39	5.43	6.94
So. Africa (comm. rand)	3.72	3.63	4.18	8.20	8.01	9.23
So. Korea (won)	1,036	1,036	982.25	2,284	2,284	2,165
Spain (peseta)	138.69	138.48	180.60	305.76	305.29	398.16
Sweden (krona)	8.16	8.17	10.24	17.98	18.01	22.57
Switzerland (franc)	1.85	1.86	2.55	4.08	4.10	5.62
Taiwan (dollar)	38.62	38.78	37.64	85.15	85.49	82.99
UK (pound)	0.75	0.75	1.03	1.66	1.65	2.27
US (dollar)	1.45	1.45	1.65	3.20	3.20	3.64

SWU Value And UF_6 Value[1]

Country (currency)	SWU Value at 0.30 w/o Tails Assay			UF_6 Value per kg U as UF_6		
	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)	This Month (Dec. 31, 1990)	Last Month (Nov. 30, 1990)	12 Months Ago (Dec. 31, 1989)
Australia (dollar)	66.15	66.10	67.95	37.29	37.27	33.34
Belgium (franc)	1,575	1,586	1,918	887.89	893.97	941.05
Canada (dollar)	59.16	59.36	62.48	33.35	33.47	30.66
EC (ecu)	37.71	36.99	44.85	21.26	20.85	22.01
Finland (markka)	184.72	183.80	217.83	104.13	103.61	106.89
France (franc)	259.33	259.21	312.50	146.19	146.12	153.35
Germany (mark)	76.24	76.83	91.40	42.98	43.31	44.85
Italy (lira)	57,426	57,705	68,337	32,372	32,530	33,536
Japan (yen)	6,880	6,804	7,777	3,878	3,835	3,816
Netherlands (guilder)	85.96	86.68	103.01	48.46	48.86	50.55
So. Africa (comm. rand)	130.80	127.76	136.95	73.74	72.02	67.20
So. Korea (won)	36,439	36,439	34,548	20,542	20,542	19,476
Spain (peseta)	4,878	4,871	5,911	2,750	2,746	2,901
Sweden (krona)	286.84	287.32	334.99	161.70	161.97	164.39
Switzerland (franc)	65.08	65.43	83.38	36.68	36.89	40.92
Taiwan (dollar)	1,358	1,364	1,324	765.77	768.88	746.37
UK (pound)	26.49	28.32	33.73	14.93	14.84	16.55
US (dollar)	51.00	51.00	54.00	28.75	28.75	26.50

[1]Calculated using currency exchange rates published in *The Wall Street Journal* on the last working day of the month.

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INDUSTRY BRIEFS

Nevada Still Challenging Yucca Mountain Repository

On December 17, the State of Nevada filed a petition to the US Supreme Court appealing the September decision of the US Court of Appeals that invalidated Nevada's actions to block DOE site characterization at the proposed Yucca Mountain national high-level waste repository. In a related case, the US District Court in Las Vegas, Nevada has postponed, until January 15, 1991, consideration of DOE's suit against Nevada (which seeks to force Nevada to act on three permit applications) to allow Nevada time to respond to a motion for summary judgement by the Department of Justice.

♦♦♦

Green Party Loses Seats In German Parliament

On December 2, in the first parliamentary election since unification, the anti-nuclear Green Party lost its 42 seats in the Bundestag (Parliament). The Green Party received only 4.8% of the vote, while 5% is the minimum to maintain representation, and therefore must give up its Bundestag offices and election funding. In the election, anti-nuclear issues appear to have taken a back seat to issues of German unification.

Ontario Hydro Must Give Millions to Opposition Groups

The Ontario Environmental Assessment Board has determined that Ontario Hydro must supply C$23 million (of C$60 million requested) to intervenor groups. The awards will fund the intervenor groups' preparation of their cases for the environmental review of Ontario Hydro's long-term energy plans.

The largest single allocation, nearly C$3 million, went to the nine-member Coalition of Environmental Groups. Indian tribes will receive almost C$8 million. Over 20% of the $23 million award will cover legal fees. The unusually large total award adds to the obstacles facing Ontario Hydro's long-term plans (which include 10 more nuclear power plants) following the anti-nuclear New Democratic Party's victory in the recent provincial election.

♦♦♦

International Nuclear Societies Form Council

The American Nuclear Society, European Nuclear Society, and nuclear organizations from seven other countries worldwide have formed the International Nuclear Societies Council (INSC). The intent in forming the INSC is to bring together professionals in nuclear energy from around the world.

PNC Transfers Interest In Midwest Project

On December 13, PNC (Power Reactor and Nuclear Fuel Development Corporation) of Japan agreed in principle to transfer its 15% interest in the Midwest Project to Overseas Uranium Resources Development Company Ltd. (OURD) of Japan. OURD is a privately-owned company, with a majority of its interests held by nine Japanese utilities and eight mining companies.

The transfer of PNC's interest as the project readies for commercial development follows PNC's charter which dictates only research, exploration, and demonstration of a project. PNC acquired its interest in the Midwest Project, located in Saskatchewan, Canada, in 1987. Other companies with interests in the project remain Denison Mines Ltd. as operator (45%), Uranerz Exploration & Mining Ltd. (20%), and Bow Valley Industries Ltd. (20%).

♦♦♦

Taiwan Power To Invest In Reno Creek ISL Project

The board of Taiwan Power Company has approved an investment in the Reno Creek in-situ leaching uranium mining project in Wyoming. Taiwan Power Company will purchase a one-third interest in the project, if government approvals are received. Exploration is continuing although development of the project is delayed until the market improves.

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FOCUS

SOVIET UNION'S NUCLEAR POWER PROGRAM

Glasnost has dramatically increased the availability of information about the Soviet Union's nuclear industry. In the future, even more information is likely to become known as Soviet participation in international forums increases. Not only is much more general information now available, but up-to-date details are regularly provided, including information such as the Soviet nuclear industry's strategic direction and goals, recent reactor design changes, safety inspection results, and reports of public opposition and protest. This article summarizes the current status of the Soviet nuclear power program, reconciling the often conflicting reports from various public sources.

Program Development

In March 1986, one month before the Chernobyl accident, the Soviet Union's 15 commercial nuclear power stations operated 41 different reactors with a total generating capacity of 28,000 MWe. By late 1990, 16 stations were operating 47 reactors with a total generating capacity of nearly 34,000 MWe. Although nuclear power had grown, the program had fallen far behind schedule. In 1985, the Soviet Union had planned to double nuclear power generating capacity in five years, reaching 60,000 MW by 1990, and growing to nearly 200,000 MW by the year 2000. Current goals call for 50,000–80,000 MW of installed capacity by 2005, with expectations toward the lower end of the range.

The Soviet Union's installed electricity generating capacity (including coal, gas, oil, and nuclear) doubled between 1970 and 1987, growing faster than that of the UK, USA, West Germany, or Italy. But demand grew even faster than supply. With the Soviet Union's current energy situation, supply can barely satisfy demand. A major cause is that electricity is used so inefficiently. This leads to such high demand that intermittent shortages occur. Furthermore, public opposition to fossil fuel plants (because of environmental concerns) and to nuclear power plants have aggravated the situation.

Because of the Chernobyl accident, feelings of nationalism in the republics, and the openness now permitted in the Soviet Union, public expression of opposition to nuclear power plants has reached unprecedented levels. Protests and public pressure have led to cancellations, delays, and closures of nuclear plants in several of the Soviet republics.

Nuclear Electricity Generation

The Soviet Union is still the third-largest nuclear-generating country in the world, after the USA and France. The Soviet Union is currently operating 47 commercial power reactors with a total generating capacity of 33,810 MWe net (**Table 1**). This includes 25 VVERs (PWR type), 20 RBMKs (graphite moderated, channel type), and 2 FBRs (Fast Breeder Reactors). Ten reactors are still under construction, and the Soviet Union also has a number of nuclear-powered, district heating stations operating and under construction.

The sixteen operating nuclear power stations are located primarily in the western part of the country, where the large majority of the 280 million Soviet citizens live. The stations are located in four of the 15 different republics that make up the Soviet Union. Nine stations are located in Russia, the country's largest republic; the others are located in the Ukraine, Lithuania, and Kazakhstan (**Figure 1**). In 1989, nuclear power generated 212,600 GwH of electricity, which represents about 12.5% of the total Soviet electricity generation. The average load factor in 1989 for all of the operating nuclear plants was 69.3 percent. Two new reactors (Smolensk 3 and Zaporozhe 5) began commercial operation in the past year or so, but plans for additional reactors at many stations have been cancelled or indefinitely postponed. Several units (both operating and under construction) have been shutdown or cancelled (**Table 2**). The following updates review the status of several of the stations, including stations that are operating, under construction, or planned. The most current information on the units is included, but changes are occurring so quickly that a unit's status can often change in less than a week's time.

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Table 1
NUCLEAR POWER UNITS IN THE SOVIET UNION

Units In Operation

Unit	Lead Utility or Fuel Buyer	Capacity (MWe Net)	Type	COD [1]
Balakovo 1	MAEI[2]	950	VVER[3]	1986
Balakovo 2	MAEI	950	VVER	1988
Balakovo 3	MAEI	950	VVER	1989
Beloyarsk 3	MAEI	560	FBR[4]	1981
Chernobyl 1	MAEI	650	RBMK[5]	1978
Chernobyl 2	MAEI	650	RBMK	1979
Chernobyl 3	MAEI	925	RBMK	1982
Ignalina 1	MAEI	1,380	RBMK	1985
Ignalina 2	MAEI	1,380	RBMK	1989
Kalinin 1	MAEI	950	VVER	1985
Kalinin 2	MAEI	950	VVER	1987
Khmel'nitski 1	MAEI	950	VVER	1988
Kola 1	MAEI	411	VVER	1973
Kola 2	MAEI	411	VVER	1975
Kola 3	MAEI	411	VVER	1982
Kola 4	MAEI	411	VVER	1984
Kursk 1	MAEI	650	RBMK	1977
Kursk 2	MAEI	650	RBMK	1979
Kursk 3	MAEI	925	RBMK	1984
Kursk 4	MAEI	925	RBMK	1986
Leningrad 1	MAEI	650	RBMK	1974
Leningrad 2	MAEI	650	RBMK	1976
Leningrad 3	MAEI	925	RBMK	1980
Leningrad 4	MAEI	925	RBMK	1981
Novovoronezh 2	MAEI	336	VVER	1970
Novovoronezh 3	MAEI	385	VVER	1972
Novovoronezh 4	MAEI	385	VVER	1973
Novovoronezh 5	MAEI	950	VVER	1981
Rovno 1	MAEI	361	VVER	1981
Rovno 2	MAEI	384	VVER	1982
Rovno 3	MAEI	950	VVER	1987
Smolensk 1	MAEI	925	RBMK	1983
Smolensk 2	MAEI	925	RBMK	1985
Smolensk 3	MAEI	925	RBMK	1990
South Ukraine 1	MAEI	950	VVER	1983
South Ukraine 2	MAEI	950	VVER	1985
South Ukraine 3	MAEI	950	VVER	1989
Troitsk 3	MAEI	90	RBMK	1960
Troitsk 4	MAEI	90	RBMK	1960
Troitsk 5	MAEI	90	RBMK	1961
Troitsk 6	MAEI	90	RBMK	1963

(continued on next page)

[1] COD = Commercial Operation Date
[2] MAEI = Ministry of Atomic Energy and Industry
[3] VVER = Vodo-Vodyanoi Energetichesky Reaktor
[4] FBR = Liquid Metal Fast Breeder Reactor
[5] RBMK = Reaktory Bolshoi Moshchnosti Kanalnye

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Table 1
NUCLEAR POWER UNITS IN THE SOVIET UNION
(continued)

Units In Operation *(continued)*

Unit	Lead Utility or Fuel Buyer	Capacity (MWe Net)	Type	COD[1]
Zaporozhe 1	MAEI[2]	950	VVER[3]	1985
Zaporozhe 2	MAEI	950	VVER	1985
Zaporozhe 3	MAEI	950	VVER	1987
Zaporozhe 4	MAEI	950	VVER	1988
Zaporozhe 5	MAEI	950	VVER	1989
BN–350	SCAE[6]	135	FBR[4]	1973
Total		**33,810**		

1989 Total Electricity Generation : **212,600 GwH**
1989 Average Load Factor : **69.3%**

Units Under Construction

Unit	Lead Utility or Fuel Buyer	Capacity (MWe Net)	Type	COD[1]
Balakovo 4	MAEI	950	VVER	1992
Balakovo 5	MAEI	950	VVER	1995
Balakovo 6	MAEI	950	VVER	1998
Kalinin 3	MAEI	950	VVER	1993
Kalinin 4	MAEI	950	VVER	1995
Khmel'nitski 2	MAEI	950	VVER	1990
Kostroma 1	MAEI	950	VVER	1994
Kostroma 2	MAEI	950	VVER	1995
Kursk 5	MAEI	925	RBMK[5]	1995
Tatar 1	MAEI	950	VVER	1994
Total		**9,475**		

[1] COD = Commercial Operation Date (actual or expected)
[2] MAEI = Ministry of Atomic Energy and Industry
[3] VVER = Vodo-Vodyanoi Energeticheskiy Reaktor
[4] FBR = Liquid Metal Fast Breeder Reactor
[5] RBMK = Reaktory Bolshoi Moshchnosti Kanalnye
[6] SCAE = State Committee for Atomic Energy

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Table 2
NUCLEAR POWER UNITS IN THE SOVIET UNION

Units Shutdown, Cancelled, or Indefinitely Deferred

Unit	Capacity (MWe Net)	Type	COD[1]	Shut Down[2]	Year Cancelled[3]
Aktash 1	950	VVER[4]	1989c	—	1989
Aktash 2	950	VVER	1991c	—	1989
Armenia 1	376	VVER	1979	1989	—
Armenia 2	376	VVER	1980	1989	—
Azerbaijan	950	VVER	1998p	—	1988
Bashkir 1	950	VVER	1991c	—	1990
Bashkir 2	950	VVER	1992c	—	1990
Beloyarsk 1	102	RBMK[5]	1964	1983	—
Beloyarsk 2	146	RBMK	1969	1989	—
Chernobyl 4	925	RBMK	1984	1986	—
Chernobyl 5	925	RBMK	1991c	—	1989
Chernobyl 6	925	RBMK	1992c	—	1989
Georgia	950	VVER	1998p	—	1989
Ignalina 3	1,380	RBMK	1994p	—	1989
Ignalina 4	1,380	RBMK	1995p	—	1989
Khmel'nitski 3	950	VVER	1991c	—	1990
Khmel'nitski 4	950	VVER	1992c	—	1990
Khmel'nitski 5	950	VVER	2000p	—	1989
Krasnodar 1	950	VVER	1992p	—	1988
Kursk 6	925	RBMK	1996c	—	1989
Minsk 1	925	VVER	1988c	—	1988
Minsk 2	925	VVER	1991c	—	1988
Novovoronezh 1	265	VVER	1964	1988	—
Odessa 1	925	VVER	1989c	—	1988
Odessa 2	925	VVER	1990c	—	1988
Rostov 1	950	VVER	1990c	—	1990
Rostov 2	950	VVER	1992c	—	1990
Rostov 3	950	VVER	1995c	—	1990
Rostov 4	950	VVER	1996c	—	1990
Rovno 4	950	VVER	1991c	—	1990
Smolensk 4	925	RBMK	1990c	—	1989
South Ukraine 4	950	VVER	1991c	—	1990
Troitsk 1	90	RBMK	1958	1987	—
Troitsk 2	90	RBMK	1959	1987	—
Zaporozhe 6	950	VVER	1992c	—	1990
BN–800	750	FBR[6]	1996c	—	1990
BN–1600	1,500	FBR	1996p	—	1989
Total	**30,930**				

[1] COD = Commercial Operation Date (actual or expected)
c = construction started on unit; p = unit was still in planning stage

[2] Year of shutdown if unit reached commercial operation

[3] Year when plans were cancelled or when construction was halted if unit did **not** reach commercial operation.

[4] VVER = Vodo-Vodyanoi Energeticheskiy Reaktor

[5] RBMK = Reaktory Bolshoi Moshchnosti Kanalnye

[6] FBR = Liquid Metal Fast Breeder Reactor

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Operating Stations

Two Reactors Begin Operation

Zaporozhe 5, a 950 MWe (net) VVER, began commercial operation late in 1989. Zaporozhe 6, which was nearly complete and scheduled to begin operation in 1991, fell victim to a recently-passed moratorium in the Ukraine. The only reactor to begin operation in 1990 was Smolensk 3, a 925 MWe (net) RBMK. This was the first RBMK reactor to start up since the Chernobyl accident. Several design changes and backfits were incorporated in the unit to improve the safety of the reactor.

Chernobyl

On August 1, 1990 the Ukraine Parliament voted 363-5 to shut down the entire Chernobyl station within five years. Units 1, 2, and 3 are still operating, while plans for units 5 and 6 had already been cancelled. How soon the station will close is still being debated. The republic wishes to start the phaseout this year, but the reality of Soviet energy needs in the near term must also be taken into account.

First Generation RBMKs Downrated

In June 1990, the State Committee for the Supervision of Safety in Industry and Nuclear Power (SINP) ordered the downrating of six, first-generation RBMK units (Chernobyl-type) to improve the safety of their operations. The 1000-MWe units were downrated to 700 MWe (gross). The reactors affected are Chernobyl 1, 2; Kursk 1, 2; and Leningrad 1, 2. This downrating will likely be temporary until planned safety improvements can be implemented.

Armenia Station

Armenia Units 1 and 2 (440-MWe VVERs) were shut down in 1989 in response to pressure from local residents fearing the safety of the plant during earthquakes. The federal government has considered restarting the plants because of a severe energy shortage in the region. However, seismic safety of the reactors is still being questioned, and local ethnic violence (Armenians versus Azerbaijanis) has caused much of the skilled labor force qualified to operate the plants to flee the area.

Novovoronezh

Units 2–5 of this five-unit station are still operating. Unit 1 was retired in 1988, after a 24-year life. Unit 2 was scheduled to be shut down during 1990, but has continued operating due to strong demand and a lack of replacement generating capacity.

Kola

Plans are being discussed to build two 950-MWe (net) units to replace the four older 411-MWe (net) VVERs as they reach the end of their useful life in the mid-1990s. No decision has yet been made, but because of the station's proximity to Finland, international relations will be given serious consideration in the planning process.

Map Legend
Soviet Operating Nuclear Power Stations

Station	Reactors
1 – Kola	■■■■
2 – Leningrad	◆◆◆◆
3 – Kalinin	■■□□
4 – Ignalina	◆◆◇◇
5 – Smolensk	◆◆◆◇
6 – Rovno	■■■□
7 – Chernobyl	◆◆◆◇◇◇
8 – Khmel'nitski	■□□□□
9 – Kursk	◆◆◆◆◇◇
10 – Novovoronezh	□■■■■
11 – Zaporozhe	■■■■■□
12 – South Ukraine	■■■□
13 – Balakovo	■■■□□□
14 – BN–350 (Shevchenko)	▮▮
15 – Troitsk	◇◇◆◆◆◆
16 – Beloyarsk	◇◇▮▮

■ = VVER in commercial operation
□ = VVER under construction
□ = VVER shutdown, cancelled, or deferred
◆ = RBMK in commercial operation
◇ = RBMK under construction
◇ = RBMK shutdown, cancelled, or deferred
▮▮ = LMFBR in commercial operation

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Figure 1
Operating Nuclear Power Stations in the Soviet Union

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Units Under Construction

Ukraine Moratorium

During 1990, the Ukrainian Parliament passed a five-year moratorium, halting all plans and construction on nuclear plants in the republic. While a ruling by a republic does not take precedence over federal regulations, it can be effective because the republic provides all of the local labor and supplies necessary for construction. The Ukraine currently has 15 operating reactors at four stations with a total capacity of nearly 14,000 MWe. The moratorium has halted work at units 3, 4, and 5 at the Khmel'nitski station, Aktash 1 and 2, Rovno 4, Zaporozhe 6, and South Ukraine 4. Several of these units are virtually complete and had been scheduled to begin operation within approximately one year. Construction on Aktash 1 and 2 had been effectively stopped in 1989 due to local opposition. Following a three-year debate, the USSR Council of Ministers officially halted the Aktash projects in 1990, even though the units were complete and ready to begin operation in 1989.

Rostov

Work on the four-unit (950-MWe VVER each) Rostov station was stopped during 1990. Units 1 and 2 were under construction and expected to come on line within a year. Units 3 and 4 were in the final planning stages. Local opposition to the plants halted the project. The opposition claimed that the station was subject to the new laws that require a minimum distance of 25 km from any population center, yet the site is located only 12 km from the Russian city of Volgodonsk. The opposition also claimed numerous safety violations even before the plants were completed. Local residents expressed a willingness to tolerate heat and energy shortages as a result of the stoppage. The units are now being considered for conversion to gas–fired plants.

Bashkir Station

Four units were originally planned for the Bashkir station in Armenia. Units 1 and 2 (950-MWe VVERs) had construction halted in 1990 because it was determined that the station was located in a seismically active region.

FBRs at South Urals

Three Fast Breeder Reactors (FBR model BN–800) have been planned for a station near Chelybinsk. The project has been approved by all national authorities and work began in 1984. However, local opposition from the public has delayed the project. Regional authorities are evaluating recent environmental impact statements and public pressure has the local authorities beginning to question the project as well.

Planned Stations

Karelia

Plans to build a 6000-MWe station (6 x 1000 MWe) in the Karelia region near the Finnish border have been abandoned. The Soviet government had examined several sites in the region, but Finnish government pressure led to the cancellation of those plans before site selection.

Yaroslavl

The Ministry of Nuclear Power stopped looking for a site to locate a nuclear heat and power station at Yaroslavl, a city northeast of Moscow. Despite continual electrical shortages, local residents opposed the plant. Authorities are now considering developing plans for a coal-powered plant.

Government Commitment to Nuclear Power

The Soviet Union's nuclear program faces the same challenges of reactor safety, waste disposal, and public acceptance that face western nuclear programs. A few years ago it was unthinkable that local opposition would be able to halt construction. But since the Chernobyl accident in 1986, the government has increased its emphasis on safety at its facilities and has recently begun responding to local concerns.

The Soviet government is still firmly committed to nuclear power because it realizes the country's dire need for clean, safe energy supplies to further economic growth. The government has announced that it will no longer construct RBMK reactors, but will concentrate on building VVER–1000 reactors, with the assistance of western safety expertise.

In July 1990, a group of Soviet nuclear experts, under the leadership of Vitaly Kenovalov, Minister of Atomic Energy and Industry, met to discuss the situation. The group sent a message to President Gorbachev, the Supreme Soviet, and all governments of the republics urging the revival of the Soviet nuclear industry. The group stressed that emotional opposition is threatening a major source of power, and that nuclear power must be sustained and must play a vital role in the development of the country. ■

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1990 INDUSTRY DEVELOPMENTS

Africa

Namibia Gains Independence From South Africa

On March 21, Namibia gained its independence from South African rule. The South West Africa People's Organization (SWAPO) won the majority of the votes, and named Sam Nujoma as President. The Namibian constitution establishes the country as a sovereign republic, founded on the principles of democracy. Namibia also became the 160th member of the United Nations and accepted the 50th membership in the Commonwealth of Nations.

Sanctions Lifted From Namibia

With its independence from South Africa established on March 21, countries viewed Namibia as separate from South Africa, and its apartheid social structure. Therefore, the US and Canada immediately removed anti-apartheid sanctions against Namibia. US President Bush issued a statement revoking sanctions and establishing diplomatic relations, and stated "We welcome Namibia as a full trading partner and are taking steps to ensure that it is given access to the American market." Canada lifted its ban on new contracts for uranium conversion of Namibian material.

Namibia Seeks Uranium Sales in Japan

The Namibian Trade Minister was in Japan in late October seeking to promote the sale of Namibian uranium. He visited the Secretary General of the Japanese Energy Bureau and several Japanese utilities. The Energy Bureau stated that Japan's expanding nuclear programs would offer new supply opportunities. Namibia will be setting up an office in Tokyo to pursue such sales opportunities.

UK Eases Sanctions Against South Africa

In February, the United Kingdom became the first country to loosen anti-apartheid sanctions against South Africa, when a voluntary ban on new investments in South Africa was lifted. The US is retaining its sanctions until the all five of its criteria for lifting sanctions have been met. Three had been met by the end of the year, and the other two showed significant progress.

Freegold Production Suspended

As of September 30, Freegold suspended uranium production at its Joint Metallurgical Scheme in South Africa. Rising costs and falling uranium prices were cited at the deciding factors for the suspension.

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Australia

Events Suggest Policy Changes

Events in October indicate possible changes in, or the interpretation of, the federal government's uranium policy, particularly its three mines policy. Among the events were:

- The Industry Commission's findings that the development of uranium mines should be decided by commercial interests, and that there is no clear rationale for the three mines policy.
- The aggregate purchase, by three ERA shareholders (North Broken Hill Peko Ltd., Cogema, and Rheinbraun AG) of more than 31% of Pancontinental Mining Ltd. This was likely a strategic move so that ERA is positioned to pressure Pancontinental to sell or share control of its huge Jabiluka deposit, if and when the government's uranium policy is changed.
- The Australian Minister of Environment stated that she could support uranium mining in environmentally sensitive areas, if strict environmental standards were met.

General Atomics Buys Beverley Mine

General Atomics (GA) concluded an agreement in August to purchase the Beverley uranium property from TMOC Resources, a subsidiary of Australia Gas Light Company. GA's long-term objective is to develop the property (an estimated 30 million pounds equivalent U_3O_8, at an average in-situ grade of 0.27%), subject to market conditions and Australian government approval.

This acquisition is GA's first step in expanding its front-end fuel cycle activities. GA already owns the Sequoyah Fuels Corporation, a US uranium conversion business located in Gore, Oklahoma.

QML Sells Uranium Stockpile

QML (Queensland Mines Ltd.) reached an agreement in May to sell its 6.5 million pound uranium inventory and associated sales contracts to a Nukem GmbH of Germany.

Europe

Uranium Mines Close

Cogema closed its Ecarpière uranium mine at Getigne and suspended activities at Piriac, early in 1990. Cogema also announced that the Chardon-en-Loire and La Commanderie operations would be closed by the end of 1990, and that the concentrates plant operated by Cogema's subsidiary, Société Industriele des Minerais de l'Ouest, will be closed in 1991.

Wismut AG, based in East Germany, announced in September that its mining operations, consisting of six uranium mines and one mill, would be closed by 1995. Wismut is an East German and Soviet uranium producing partnership (50%-50%) that was formed in 1954.

The Yugoslavian republic of Slovenia halted production at the Zirovski vrh uranium mine and mill in October. The mine and mill were officially closed in December following a parliamentary review of the economic feasibility of the Zirovski operation.

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Europe (continued)

Glencar Exploration of Ireland Enters Joint Venture with Hungary's Mecsek

In November, Glencar Exploration, plc. of Ireland entered into a joint-venture agreement with Hungary's Mecsek Ore Mining Company. Glencar, as a major joint-venture partner, and will redevelop and manage the Pecs uranium mine near the Yugoslavian border. Glencar replaces Mecsek as the mine's operator. Two of the three Pecs mines are already mined out; the remaining mine has an annual production of approximately 500 MTU in concentrates.

Nuclear Reactor Shutdowns, Delays, and Moratoriums

- **Poland**'s government voted on September 4 to abandon work on the two Zarnowiec 440-MWe (net) VVERs, and to suspend any further nuclear projects until the year 2000, though nuclear power is still planned for the future. The Zarnowiec reactors, started in 1982, were only 30% complete and were plagued with economic and technical problems.
- **Swiss** voters, on September 23, rejected a proposal for the progressive abandonment of nuclear energy (which provides 40% of Swiss electrical production). However, the voters did approve another initiative which called for a 10-year moratorium on new nuclear plant licensing and construction.
- The **Italian** government, in September, ratified a July 12 resolution of the Italian Parliament that called for the permanent closure of ENEL's (Ente Nazionale per l'Energie Electrica) Trino Cercellese and Caorso nuclear power plants. The government will ultimately reimburse ENEL for the decommissioning costs.
- The **Spanish** government announced in May the permanent closure of the Vandellos 1 nuclear unit, shut down in October 1989 following a fire. The decision was based on high repair and modernization costs.
- The **Czechoslovakian** government also announced in May the delay of the completion date for the Temelin-1 and -2 1,000-MWe VVER nuclear units. The two Soviet PWRs will be backfit with Western safety technology, causing a two-year delay in the completion dates to 1994.
- **Sweden** continues to undergo conflict and dissension over the 1980 mandate to phase out nuclear power. Public polls now show the public may not want to phase out nuclear power, and many party members do not support party policy on the nuclear phase-out issue. None of the five parties have formed useful alliances on the issue, while a number of parliamentary motions have been passed that impose a virtual gridlock on the energy source options to replace nuclear. It is unlikely that any party will try to force decisions on the phaseout deadline before the national parliamentary elections in September 1991, because the dramatic consequences of implementing any of the currently available options would polarize voters, jeopardizing that party's success in the election. This political jockeying makes it unlikely that the schedule to initiate the phaseout of the first two reactors in 1995 will be met.

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Europe (continued)

Foratom Accepts Czechoslovakia, and Invites Soviet Observers –Hungary Forms New Society

Foratom announced September 4 that Czechoslovakia would become Foratom's first East European member. Foratom already included 13 West European members in its non-governmental association of national nuclear forums. Foratom also invited representatives from the Soviet nuclear community to observe Foratom's November 26 meeting in Prague.

Members of the recently-formed Hungarian Nuclear Society (HNS) were also invited to the November Foratom meeting. Hungary will not seek membership in Foratom, because Hungary decided to focus its energies in a single body and formed the HNS.

US, Hungary and Czechoslovakia Agree on Uses of Nuclear Power

US, Hungarian, and Czechoslovakian officials, meeting in September in Vienna, Austria, agreed to cooperate in the safe and peaceful uses of nuclear power. Thus, US equipment suppliers will be permitted to supply substantially more equipment to the Hungary and Czechoslovakia than previously allowed.

Unification Spurs Consolidation of German Electric Utilities

On October 3, Germany officially became one country again, after 45 years of division. On August 22, West Germany's electric utilities signed a contract with the East German government establishing the basic plan for restructuring East Germany's electricity supply industry. The three largest electric utilities in West Germany, Bayenwerk AG, Preusseneleckta AG, an RWE AG agreed to acquire a majority interest in most of East Germany's electricity production and distribution. However, these three utilities have chosen not to assume responsibility for the East German nuclear power plants. The three utilities are forming a number of new companies to own and operate the non-nuclear electricity production and the 15 regional electricity distribution areas. The government retains an interest in each of these companies, which it is allowed to sell to other investors.

Ellweiler Uranium Processing Plant Being Decommissioned

Ellweiler, the sole uranium processing plant in western Germany is being decommissioned. The plant's license was suspended May 31, 1989 due to radon gas emissions from mill tailings that were above maximum allowed levels. Gewerkschaft Brunhilde GmbH owns the Ellweiler facility near Trier, and will perform the decommissioning.

VEW Signs Reprocessing Contract with BNFL

In April, Vereinigte Elektrizitätswerke Westfalen AG (VEW) became the first German utility to sign a long-term reprocessing contract with British Nuclear Fuels plc. (BNFL) following the 1989 cancellation of the Wackersdorf reprocessing plant in western Germany.

Germany Purchases Nukem Plant for Plutonium Storage

In July, the West German Federal Government expressed its intention to purchase Nukem's fuel fabrication plant to store up to 2.5 tons of plutonium.

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Europe (continued)

RWE Acquires Greater Interest in Nukem after Reorganization

In June, RWE AG of Germany bought Degussa AG's 35% interest in Nukem, boosting its interest in Nukem to 90%. Metallgesellschaft of Germany retains the remaining 10% minority interest. This transaction continues the consolidation and reorganization of the German nuclear industry following the government's investigation of Transnuklear-Hanau (a Nukem subsidiary) in 1987.

In January, RWE announced that the company's name had officially been changed to RWE AG, from the former name of Rheinisch-Westfälische Elecktrizitätswerke AG, and had reorganized with RWE AG acting as a holding company for nearly 150 companies, arranged under five sub-divisions.

CGE Agrees To Relinquish Control of Framatome

In November, CGE (Compagnie Générale d'Electricité; a French Energy conglomerate) agreed to sell 8% of its 52% interest in Framatome S.A. (the French nuclear engineering and construction company) to state-controlled companies, which will now own 56%, for the sum of approximately FF650 million (US$130 million). Both Framatome and the French government wanted Framatome state-controlled, and used numerous legal challenges to force CGE to relinquish the majority position it gained early in 1990 by buying the French firm Dumez's 10% interest.

French Nuclear Facility Updates

- Cogema's **La Hague UP3** fuel reprocessing center became fully operational on August 26. Cogema had contracts for approximately 7,000 MTU of reprocessing—nominal capacity is 800 MTU per year.
- **Chinon A3**, Electricité de France's (EdF) oldest reactor, was closed on June 15. The 500-MWe GCR unit had operated for 24 years and produced 31.5 billion kwH. Only two operating GCRs remain in France—Bugey 1 and St. Laurent A2. Both are scheduled for decommissioning in 1992.
- The **Melox** mixed-oxide (MOX) fuel fabrication plant received its operating license on May 21. Located at Marcoule, France, the plant has been under construction since 1989, and should be completed in early 1994. It will have an annual capacity of 120 MT of heavy metal, though the license currently limits production to 100 MT of heavy metal per year. The US$250 million Melox plant will process much of the plutonium from the La Hague plant into MOX fuel assemblies.
- EdF announced in May plans for **seven new 1,400 MWe nuclear plants**. EdF plans to begin construction of one per year, starting in 1993, if project funding is received from the government. EdF cited increasing electricity sales, strong economic growth in France, and a number of long-term electricity export contracts as the reason for the expansion plans. A French government study announced in early February that nuclear power would provide the cheapest source of electricity for France into the 21st century.

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Europe (continued)

Cogema Signs Reprocessing Contracts For 15 German Reactors

At a July 9 press conference, Cogema Chairman Jean Syrota announced the signing of contracts with 11 (West) German utilities for the reprocessing of nuclear fuel during 2001 through 2015. The quantities reprocessed should approximate one-half of the total West German market.

Belgium's Utilities Merge

Belgium's primary utilities—Urerg, Intercom, and Ebes—announced in January their planned merger, with the purpose of improving their competitive position in the approaching European Community in 1992. The new entity ranks as Belgium's second largest industrial firm, and will operate the country's seven nuclear reactors.

British To Sell PowerGen to Public and Tax Fossil Fuels For Nuclear

On August 23, Energy Secretary John Wakeham indicated that the British government had decided to revert to its original plan to sell PowerGen (one of Britain's two non-nuclear electricity-generating companies) to the public, rather than to Hanson PLC, a private firm. The decision was based on the better expected value of the public sale, which could raise in excess of £1.1 billion.

Secretary Wakeham had also announced, in February, that the government would place a 10.6% tax on fossil fuel sales. This "nuclear tax" requires area electricity distribution companies to buy a total of 8,000 MW of the higher-priced nuclear-generated electricity through 1997-98.

Far East

China To Accelerate Nuclear Program

In June, China National Nuclear Corporation (CNNC) released plans to accelerate China's nuclear power program to alleviate its energy shortage. By the year 2000, nuclear generating capacity should reach 6,000 MWe, and an additional 6,000 MWe should be under construction. China's first nuclear power plant, a 300-MWe PWR at Qinshan, is scheduled to enter operation in 1991.

Japan's Kashiwazaki Kariwa-2 Begins Commercial Operation

On September 28, Tokyo Electric Power Company (TEPCO) brought its 13th nuclear power unit, the 1,045 MWe (net) BWR Kashiwazaki Kariwa–2, into commercial operation. It is Japan's 39th commercial reactor and brings the nation's installed nuclear capacity to 30,341 MWe (net).

Japan To Build 40 Nuclear Power Plants

According to a June 5 announcement by the Ministry of International Trade and Industry (MITI), Japan will add 40 nuclear power plants in the next 20 years. Japan's 39 operating plants supply almost ten percent of the country's electricity. MITI forecasts a 38-percent growth in Japan's electricity demand between 1988 and 2010. Since the announcement, some Japanese utilities have expressed doubt that this number of plants can be built in this period. They cite a markedly increased level of public opposition to proposed locations for new nuclear facilities.

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Far East (continued)

Japan's Enrichment Progress

In October, Japan Nuclear Fuel Industries (JNFI) completed the construction of the centrifuge enrichment plant at Rokkasho, at the northern tip of Honshu, Japan's largest island. The plant is scheduled to begin operation in late 1991, with an initial capacity of 150 thousand SWU per year. JNFI plans to expand the capacity to 600 thousand SWU by 1994.

The Laser Atomic Separation Engineering Research Association, referred to as LASER-J, announced on May 14 the completion of an experimental laser-enrichment plant at the Tokai Research Establishment. The plant is designed to produce 1,000 SWU per year using the same process that the US DOE's AVLIS (Atomic Vapor Laser Isotope Separation) plans to use. The experimental plant was built to confirm the technical feasibility of the process. By September, the plant had already achieved 5% enrichment with approximately one-tenth of energy required for a typical gas diffusion plant, and confirmed the commercial feasibility of the process. A production scale experiment is proceeding based on these results, and further tests are expected to achieve at least a 65% U^{235} recovery rate.

Japan's Socialist Party Supports Nuclear Energy

In an abrupt policy reversal, Japan's Socialist Party (JSP) publicly announced in April that it supports nuclear power—pending the development of an acceptable alternative. The JSP, the government's largest opposition group, recommended that the government:

- allow existing nuclear power plants to operate, but permit no new nuclear plant construction.
- accelerate R&D efforts for alternative energy sources.
- gradually phase out existing nuclear power plants and replace them, when possible, with an "improved" energy mix.

Latin America

Mexico Studying Construction of 20 New Nuclear Plants

As a result of dwindling oil supplies, Mexico initiated technical studies for 20 additional nuclear power plants. As of August, these studies were proceeding despite the fact that Mexico's Laguna Verde-1 took 15 years and over $3 billion to complete, and Laguna Verde-2 is the country's only other reactor approved or under construction.

Soviet Union and Argentina to Cooperate in Breeder Program

Argentina and the Soviet Union signed a nuclear cooperation agreement in Moscow on October 25. With the influx of Soviet expertise, a 2010 target date has been set for bringing a joint Argentine and Brazilian breeder reactor on line. Argentina will supply the plutonium fuel by reprocessing the spent fuel from its Atucha-1 reactor at its Ezeiza reprocessing plant, while Brazil will provide the sodium moderator. All Soviet/Argentine transfers will be covered by IAEA safeguards.

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Latin America (continued)

Argentina's Atucha-1 Nuclear Power Plant Reenters Service

Argentina's Atucha-1, a 335-MWe PHWR, reentered service on January 10 after being down nearly a year and a half for repairs.

German Loans Revive Atucha-2

Argentina's government has obtained a US$133 million loan in November from a consortium of German banks, and has indicated that work will resume on the Atucha-2 nuclear station (692 MWe net) in 1991. The loans, which were contingent on Argentina supplying matching funds, were first offered in 1988 and are guaranteed by the German government. Argentina's government had considered abandoning the Atucha-2 project unless financing could be found. By the government's estimate, cost overruns have pushed the completion cost to US$1.4 billion—a figure that is 90% of original estimate for the entire construction of Atucha-2.

North America

Canadian Uranium Mine Ownership Changes

- Minatco Ltd. now owns a 100% interest in the **Wolly Project** in Northern Saskatchewan. Minatco is an affiliate of the French firm Compagnie Française des Pétroles. Minatco increased its 33% share in November by purchasing the interest held by the project's former joint-venture partners, Canadian Occidental Petroleum Ltd. and Canadian Nickel Company Ltd.
- On July 25 in Bonn, Germany, Cameco completed a C$160 million sale to Uranerz Exploration and Mining, Ltd. of a one-third interest in Cameco's **Rabbit Lake Mill, and Collins Bay and Eagle South** deposits. Uranerz is a subsidiary of Uranerzbergbau GmbH, based in Bonn. Uranerz already shared an interest with Cameco in the Key Lake facilities and Eagle North deposits.
- On December 13, Power Reactor and Nuclear Fuel Development Corporation (PNC) of Japan agreed in principle to transfer its 15% interest in the **Midwest Project** to Overseas Uranium Resources Development Company Ltd. (OURD) of Japan. OURD is a privately-owned company, with a majority of its interest held by nine Japanese utilities and eight mining companies. PNC acquired its interest in the Midwest Project, located in Saskatchewan, in 1987. Other companies with interests in the project remain Denison Mines Ltd. as operator (45%), Uranerz Exploration and Mining Ltd. (20%), and Bow Valley Industries Ltd. (20%).

Rio Algom Closes Quirke and Panel, Denison Cuts Elliot Lake Production

Rio Algom announced in late July that it was closing the Quirke and Panel uranium mines in Canada. Rio Algom submitted applications to the Atomic Energy Control Board for decommissioning licenses for the mines. Denison Mines Ltd. announced in August that it was reducing the production rate at its Elliot Lake site to 2.7 million pounds equivalent U_3O_8 per year from the previous rate of 4.3 million pounds per year.

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North America (continued)

McArthur Lake Deposit Estimated As One of the World's Largest

On May 30, Cameco announced that expectations of a large, high-grade uranium deposit had been confirmed at the McArthur Lake P2 North site in the Athabasca Basin in Saskatchewan, Canada. In November, Cameco announced that further tests at the site had revised the initial estimates, and the McArthur Lake P2 North deposit was now estimated to have reserves of 200 million pounds equivalent U_3O_8, at an in-situ grade of approximately 4%, which ranks this uranium deposit as one of the top two or three in the world. Timing of the development of the McArthur River Joint Venture will depend on the world market and other considerations such as nearby mill capacity. The joint venture is owned by Cameco (44%; operator), Uranerz Exploration and Mining Ltd. (29.4%), AGIP Resources Ltd. (10%), Interuranium Canada Ltd. (9.1%), Cogema Canada Ltd. (6.5%), and Imperial Metals Corp. (1.0%).

Nova Scotia Uranium Exploration Ban

In March, the Canadian province of Nova Scotia extended its moratorium on uranium exploration for five more years. The moratorium was originally imposed by the provincial government in 1981.

Saskatchewan Revises Uranium Royalty System

The Saskatchewan Ministry of Energy and Mines announced a new royalty system, retroactive to July 1, 1989, which assesses a 5-percent royalty on gross sales and a profit-related royalty. The profit-related royalty is incremental from 15 to 50 percent, increasing as profits increase. It can be applied against the minimum 5% royalty on gross sales. The previous system assessed royalties derived from return on investment percentages.

New Ruling Party In Ontario Hinders Ontario Hydro's Long-Term Plans

The left-wing, anti-nuclear New Democratic Party (NDP) won the majority of seats in the September 6 election in Canada's Ontario province, and took office on October 1 with NDP leader Bob Rae as premier. The NDP is acting on its campaign promises—just two months after taking office, the NDP placed a moratorium on more nuclear plants, and ordered Ontario Hydro to cancel all advanced engineering work on its 10-plant nuclear power plan. The moratorium does not affect the planning or construction at the Darlington station. In a separate event a few weeks later, the Ontario Environmental Assessment Board directed Ontario Hydro to supply C$23 million to fund intervenor groups cases at the environmental review of Ontario Hydro's long-term energy plans.

Canada Modifies Nuclear Export Policies

In May, the Canadian Ministry of Energy, Mines and Resources revised its upgrading policy on exports of uranium from Canada. Upgrading exemptions will be granted if "the uranium will be converted or enriched or consumed in the USA." The previous policy inferred that uranium had to be converted and enriched in the USA. The new policy clarifies the interpretation of the upgrading policy as it applies under the US–Canada Free-Trade Agreement.

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North America (continued)

US Uranium Mining Updates

- The **Rosita Project**'s in-situ leaching uranium mine began operation September 4. The Rosita Project (formerly known as the Rogers Project) is owned by Uranium Resources, Inc. (URI) and is located 60 miles west of Corpus Christi, Texas. The project has 6.2 million pounds equivalent U_3O_8 reserves, and expects to produce about 800,000 to 1,000,000 pounds annually.
- Ferret Exploration received its permit to proceed with in-situ leach mining at the **Crow Butte Project** from the Nebraska Department of Environmental Control in April. Production from the site near Crawford, Nebraska is scheduled to begin in 1991.
- Umetco Minerals Corporation announced on November 8 the temporary cessation of mining activities at the **La Sal**, **Sunday**, and **Dove Creek** sites in Colorado and Utah. The White Mesa mill was put on standby in October.
- Energy Fuels announced late in November the temporary shutdown of its **Kanab North** mine in Northern Arizona.
- Chevron Resources ceased mining and production at its **Mount Taylor** mine in New Mexico on January 12. Later in 1990, the mine was permanently closed. The mine was the last operating uranium mine in New Mexico—twelve years ago there were 55 mines operating.
- Pinnacle West Corporation sold **Malapai Resources Company** of Phoenix, Arizona to a subsidiary of Electricité de France (EdF), in a joint venture with a subsidiary of TOTAL Compagnie Française des Petroles of France, in the latter half of 1990. Included in the purchase are the Malapai uranium properties of **Irigaray** and **Christensen Ranch** in Wyoming, and **El Mesquite** in Texas. The complex transaction is structured through a new company formed by new subsidiaries of EdF and TOTAL. After multiple levels of ownership, Total Minerals is the operator of Malapai, and Malapai still exists as a legal entity.
- On March 22, **U.S. Energy**, its subsidiary **Crested Corporation**, and **Kennecott Corporation** agreed to a restructured joint-venture agreement for the development of uranium properties in Wyoming. The first development will be at **Green Mountain**. Kennecott is now equal partners with U.S. Energy and Crested, providing $15 million to develop properties and $50 million to fund uranium mine development.
- Taiwan Power Company (Taipower) will purchase a one-third interest in the **Reno Creek** in-situ leaching uranium project, if government approvals are received. The board of directors of Taipower approved the investment in December. Exploration is continuing at the project, although project development will be delayed until the market improves.
- **Rio Algom Mining Corp.** purchased approximately 25% of **Uranium Resources Inc.** (URI) in June. The private transaction involved over nine million shares.

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North America (continued)

US Nuclear Reactor Updates

- Philadelphia Electric Company's **Limerick** 2 unit entered commercial operation on January 8, eight months ahead of schedule.
- Texas Utilities Electric Company's (TUEC) controversial **Comanche Peak 1** unit received its full-power operating license on April 16. The NRC's unanimous approval came twelve years after the operating license application was submitted. Concerns over quality assurance caused the long delay.
- The **Seabrook** Nuclear Power Plant in New Hampshire began commercial operation in late August. Public Service of New Hampshire, the lead owner, received the full-power operating license on March 1. It is the USA's 111th nuclear power plant, and took 17 years to bring to operation from the time of application for the construction license, due to innumerable legal complications.
- Oregon citizens voted on November 6 to keep Portland General Electric's (PGE) **Trojan** nuclear plant in operation. The defeated measure sought to close the 1,095 MWe (net) PWR until the federal government opened a spent fuel repository. One reason the voters rejected the measure is that, by PGE estimates, replacement costs for Trojan's generating capacity could have reached $3 billion over 20 years.
- In August, Ebasco Services and CEGA, Inc. each won $1.5 billion DOE design contracts for **tritium reactors** to replace DOE's Savannah River facility. The two companies beat out Westinghouse's design by having simpler refueling, and using proven technologies.

New US Joint Ventures

- After three years of negotiations, Consumers Power Co. agreed in August to sell a 55% interest in its Palisades nuclear power plant to Westinghouse Electric Co. and Bechtel Power Co. The three companies will form a partnership, Palisades Generating Co., to own and operate the plant as an independent power producer. Consumers will manage the plant and purchase its output.
- In November, Babcock & Wilcox (B&W) and General Atomics (GA) formed a joint venture, named Triso, to produce fuel and perform related services for modular high-temperature, gas-cooled reactors, such as in the DOE's new production reactor (NPR) program. Triso, a 50%-50% partnership, will be located in Lynchburg, Virginia.
- Isotope Technologies, Inc. (ITI) announced on August 20 the formation of a joint-venture with Cameco and Agra Industries, Ltd., both of Saskatoon, Saskatchewan, Canada. The new venture called CRISLA Technologies, is also based in Saskatoon, and will use ITI-developed CRISLA technology (chemical reaction by isotope selective laser activation). The new company hopes to build a commercial-scale 1,000–SWU module by 1992, and once that module verifies the process, add further modules to attain a capacity of 100,000 SWU/year. Long-term plans are for a capacity of 250,000-500,000 SWU/year.

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NUEXCO

North America (continued)

President Bush Signs Radiation Victim Compensation Act

US President Bush signed into law in October legislation that sets up a $100 million fund for victims of radiation from the US nuclear defense programs. Individuals who lived near Nevada defense sites and miners producing uranium for the government's defense programs in the 1940s to 1960s, and who contracted any of 12 types of cancer known to be associated with materials used in those nuclear defense programs, are eligible to receive up to $50,000 compensation.

Nevada and DOE Battle Over Yucca Moutain HLW Repository

DOE selected Yucca Mountain, Nevada as the most likely location to store the country's high-level waste (HLW), and intended to perform site characterization studies in 1989. Nevada blocked DOE by not issuing three necessary State permits, and the Nevada legislature took further actions to prohibit HLW storage in the state. On January 25, DOE filed suit against the State of Nevada for non-issuance of the permits. The US District Court in Las Vegas, Nevada postponed consideration of the DOE's permits suit until January 15, 1991 to allow Nevada time to respond to a motion for summary judgement by the Department of Justice. Meanwhile, on September 19, the 9th US Circuit Court of Appeals in San Francisco, California ruled that the Nevada legislature's actions were not binding on the US Government, and therefore the DOE could proceed with the studies. The State of Nevada filed a petition on December 17 to the US Supreme Court appealing the Circuit Court's decision.

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NUCLEAR INDUSTRY CALENDAR

1991

Jan. 13-16 ***Nuclear Insurance Conference*** (The Peabody Hotel, Orlando, Florida).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Feb. 3-6 ***Nuclear Marketing: Utility Needs in the 1990s*** (Clearwater, Florida).
Sponsored by the American Nuclear Society.
Contact: ANS Meetings Department; 708-352-6611.

Feb. 10-13 ***Nuclear Energy and the 102nd Congress: Building Bridges for a Stable Regulatory Framework***
(The Boca Raton Resort and Club, Boca Raton, Florida).
Sponsored by the American Nuclear Energy Council.
Contact: ANEC; Fax: 202-488-1813; Address: ANEC, 410 First St. SE, Washington, DC 20003.

Feb. 27-28 ***Nuclear Safety: The Way Ahead*** (SAS Royal Hotel, Brussels, Belgium).
Co-Sponsored by the Belgian Nuclear Society, the British Nuclear Energy Society, and the Insitution of Nuclear Engineers.
Contact: Katie Lye or Louise Coote, IBC Technical Services Ltd; 44-71-236-4080.

March 24-27 ***Fuel Cycle Conference '91*** (Sheraton Scottsdale Hotel, Phoenix, Arizona).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

April 8-10 ***Japan Atomic Industrial Forum Annual Conference*** (Tokyo, Japan).
Contact: Japan Atomic Industrial Forum; 3-508-2411; or Fax: 3-508-2094.

April 14-17 ***INFO '91 Conference*** (The Westin Hotel, Chicago, Illinois).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

April 14-18 ***Third International Conference on Nuclear Fuel Reprocessing & Waste Management*** (Sendai, Japan).
Sponsored by the Atomic Energy Society of Japan and the Japan Atomic Industrial Forum, and co-sponsored by the American Nuclear Society and the European Nuclear Society.
Contact: Japan Atomic Industrial Forum; 3-508-2411; or Fax: 3-508-2094.

April 22-25 ***JAIF International Conference on Water Chemistry in Nuclear Power Plants*** (Fukui, Japan).
Contact: Japan Atomic Industrial Forum; 3-508-2411; or Fax: 3-508-2094.

May 8-10 ***Second International Conference on Transportation for the Nuclear Industry***
(Bournemouth, United Kingdom).
Co-Sponsored by the Institution of Nuclear Engineers, the European Nuclear Society, the American Nuclear Society, the Chartered Institute of Transport, and the Institution of Civil Engineers.
Contact: INE Conference Secretary; 081-698-1500 or 081-698-4750; Fax: 018-695-6409.

May 12-14 ***World Nuclear Fuel Market Annual Meeting*** (Atlanta, Georgia).
Contact: Donna Cason, World Nuclear Fuel Market; 404-447-1144.

May 14-16 ***Annual Meeting on Nuclear Technology '91*** (Hotel & Congress Center Maritim, Bonn, Germany).
Sponsored by the Kerntechnische Gesellschaft e.V. and the Deutsches Atomforum e.V.
Contact: INFORUM GmbH, Congress Office JK'91, Heussallee 10, D-5300 Bonn 1, or 0228/507 223.

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CALENDAR

1991

June 2-6 ***American Nuclear Society Annual Meeting***
(Marriot Orlando World Center, Orlando, Florida).
Contact: ANS Meetings Department; 708-352-6611.

June 23-26 ***International Conference on Enrichment*** (The Westin Hotel, Washington, DC).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Sept. 4-6 ***Uranium Institute Sixteenth Annual Symposium*** (London, UK).
Contact: Uranium Institute; 44-71-225-0303; or Fax: 44-71-225-0308.

Sept. 22-25 ***International Uranium Seminar '91*** (The Don Cesar Hotel, St. Petersburg/Tampa, Florida).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Sept. 29-Oct. 2 ***American Mining Congress Mining Convention*** (Salt Lake City, Utah).
Contact AMC Convention Office: 202-861-2800; or Fax: 202-861-7535.

Nov. 10-13 ***Nuclear Energy Forum*** (Westin St. Francis Hotel, San Francisco, California).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Nov. 10-15 ***American Nuclear Society Winter Meeting*** (Hilton Hotel, San Francisco, California).
Contact: ANS Meetings Department; 708-352-6611.

1992

April 12-16 ***8th Pacific Basin Conference*** (Taipei, Taiwan).
Sponsored by the Amercian Nuclear Society.
Contact: ANS Meetings Department; 708-352-6611.

Sept. 21-23 ***Second International Conference on Training for Operation & Maintenance in the Nuclear Industry***
(The Moat House International Hotel, Stratford-upon-Avon, United Kingdom).
Sponsored by the Institution of Nuclear Engineers.
Contact: INE Conference Secretary; 081-698-1500 or 081-698-4750; Fax: 018-695-6409.

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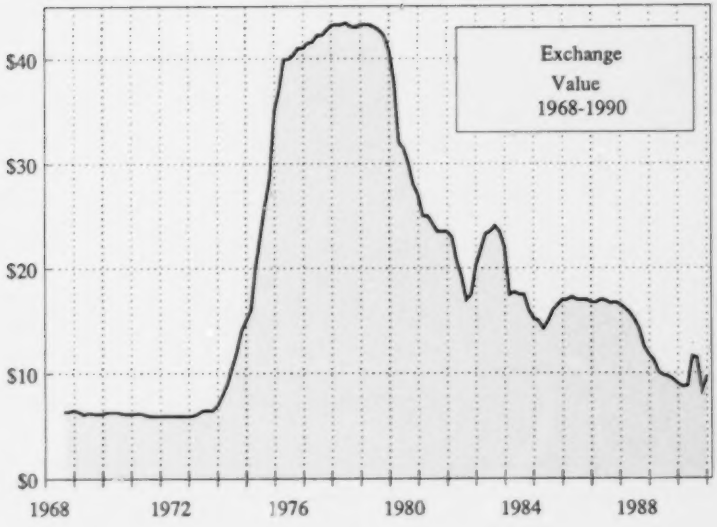
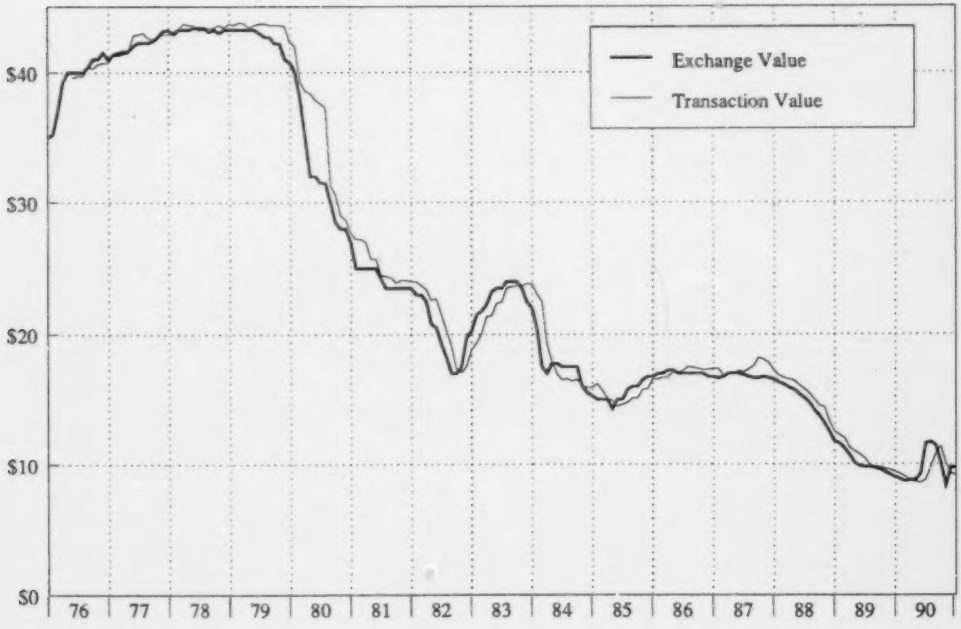
NUEXCO Historical Exchange Value and Transaction Value
(In US Dollars per Pound Equivalent U_3O_8)





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HISTORICAL MARKET VALUES

EXCHANGE VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	17.25	17.00	17.00	17.00	17.00	17.00	17.00	16.75	16.75
1987	16.65	16.75	17.00	17.00	17.00	16.90	16.75	16.65	16.65	16.75	16.65	16.55
1988	16.30	16.15	15.90	15.75	15.40	15.10	14.75	14.15	13.75	13.15	12.50	11.75
1989	11.60	11.20	10.70	10.10	9.85	9.80	9.80	9.70	9.60	9.40	9.20	9.00
1990	8.85	8.70	8.80	8.80	9.25	11.60	11.70	11.45	10.10	8.35	9.80	**9.70**

US PREMIUM (Relative to the Exchange Value)

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	0.65	0.75
1987	0.85	1.00	1.50	1.50	0.90	0.60	2.50	2.35	2.10	1.65	0.85	0.65
1988	0.70	0.50	0.15	0.25	0.60	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

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UF_6 VALUES

Determined as of the last day of the month indicated ($US/kg U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1985	—	—	—	40.50	42.50	42.50	44.00	44.50	44.50	46.00	46.00	47.00
1986	47.00	48.00	48.00	48.50	48.25	48.25	48.25	48.00	48.00	48.00	48.00	47.75
1987	47.75	48.00	48.00	48.00	47.75	47.75	47.50	47.00	46.75	47.00	47.00	47.00
1988	46.50	46.00	45.50	45.25	44.75	44.00	42.75	41.00	40.75	39.00	37.50	35.50
1989	34.75	34.00	33.00	30.50	30.25	30.25	30.00	29.75	29.75	28.25	27.75	26.50
1990	25.90	25.25	24.40	24.40	25.50	32.00	32.50	32.25	29.50	24.75	28.75	**28.75**

US UF_6 PREMIUM (Relative to the UF_6 Value)

Determined as of the last day of the month indicated ($US/kg U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	2.50	2.50
1987	2.50	2.50	3.50	3.00	2.25	1.75	6.50	6.00	4.25	3.10	2.25	2.00
1988	1.25	1.25	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

TRANSACTION VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	17.10	17.15	17.20	17.50	17.45	17.35	17.25	17.30	17.35
1987	17.35	16.90	16.95	17.00	17.20	17.10	17.30	17.55	18.20	18.05	17.80	17.20
1988	16.85	16.65	16.55	16.45	16.10	15.80	15.45	15.00	14.50	14.40	13.30	12.50
1989	12.25	12.00	11.25	11.00	10.75	10.45	9.95	9.80	9.80	9.65	9.55	9.40
1990	9.25	9.05	8.75	8.65	8.55	8.80	9.75	10.80	11.40	10.10	9.30	**9.15**

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HISTORICAL MARKET DATA

LOAN RATES

Determined as of the last day of the month indicated (Percent per Annum)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	4.00	4.00	4.00	4.00	4.00
1969	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
1970	6.00	6.20	6.40	6.50	6.50	6.50	6.50	5.00	6.50	6.00	5.50	5.50
1971	5.00	4.75	4.75	4.75	5.00	5.25	5.25	5.25	5.25	5.25	4.50	4.50
1972	4.00	4.00	4.00	4.50	4.50	4.50	5.00	5.00	5.00	5.00	5.00	5.00
1973	5.50	5.50	5.75	5.75	6.00	6.25	7.00	7.00	7.00	7.00	7.50	8.00
1974	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
1975	8.00	7.00	7.00	7.00	7.00	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1976	6.50	6.50	6.50	6.50	*	*	*	*	*	*	*	*
1977	*	*	*	*	6.50	6.50	6.50	6.75	7.25	7.25	7.25	7.25
1978	7.25	7.00	7.00	7.00	7.00	7.50	7.75	7.75	7.75	7.00	7.00	7.00
1979	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1980	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1981	7.00	7.00	7.00	7.00	7.00	5.50	5.50	5.50	5.50	6.00	6.00	6.00
1982	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1983	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1984	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1985	6.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1986	5.00	5.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
1987	3.00	3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	3.50	3.50
1988	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1989	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1990	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	**3.50**

* Float with Prime Rate

CONVERSION VALUES

Determined as of the last day of the month indicated ($US/lb U as UF_6)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.90	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.80	1.80
1987	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.90	1.90	1.90
1988	1.90	1.80	1.80	1.80	1.80	1.80	1.85	1.95	1.95	1.95	1.95	1.95
1989	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90	1.80	1.75	1.65
1990	1.50	1.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	**1.45**

SWU VALUES

Determined as of the last day of the month indicated ($US per SWU)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	80	80	80	80	75	78	78	78	78	78	80	80
1987	80	80	77	77	75	73	75	75	73	69	73	73
1988	73	73	70	68	68	68	68	65	65	65	65	65
1989	65	67	67	67	66	66	66	65	63	59	57	54
1990	54	50	50	50	50	50	50	50	50	51	51	**51**

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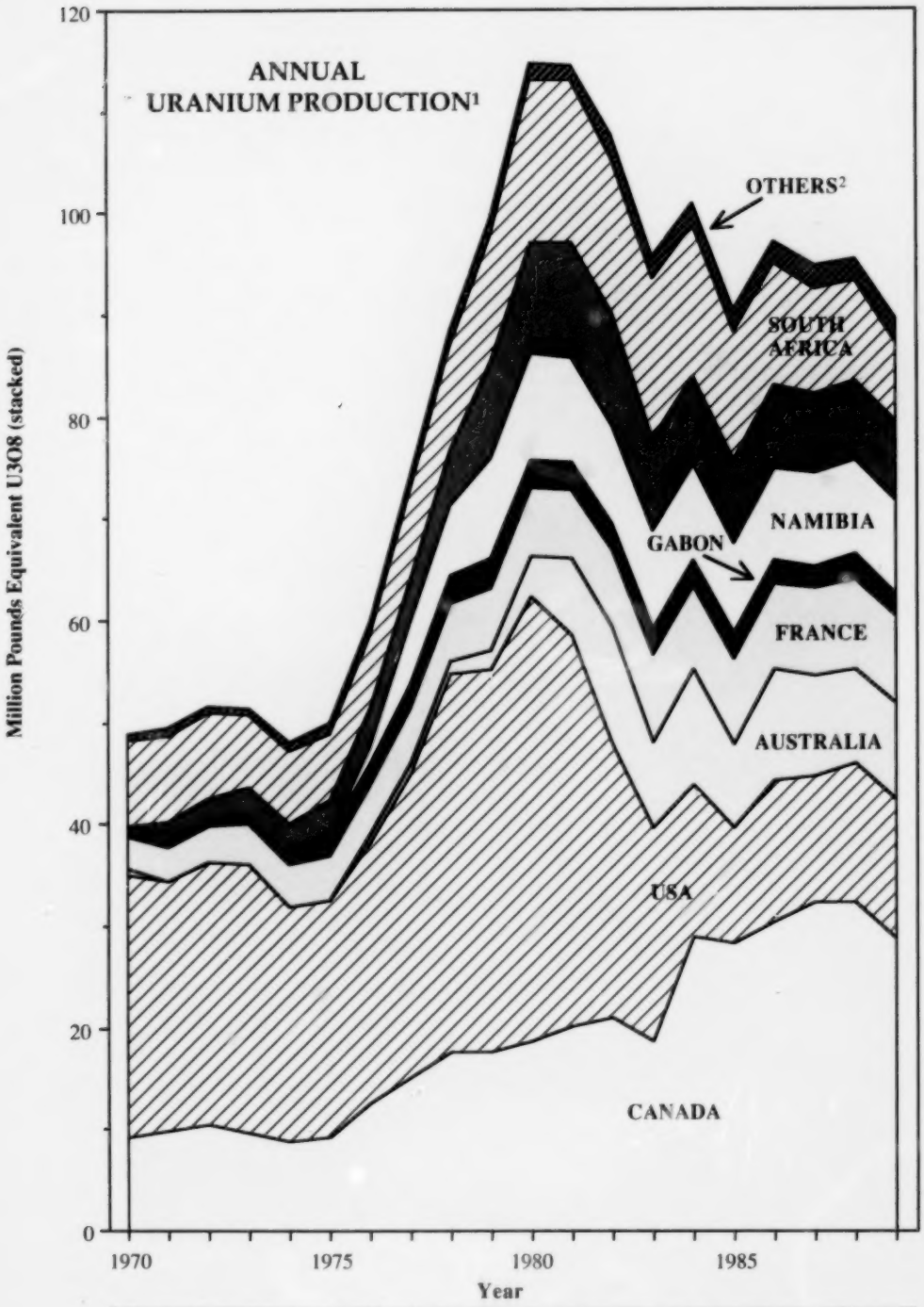

[1] Estimated world production in 1989 totalled 89.6 million pounds (Australia—9.5; Canada—28.7; France—8.5; Gabon—2.2; Namibia—9.2; Niger—7.7; South Africa—7.7; USA—13.7; Others[2]—2.3).

[2] **Others** includes: Argentina, Belgium, Brazil, India, Pakistan, Portugal, Spain, West Germany and Yugoslavia

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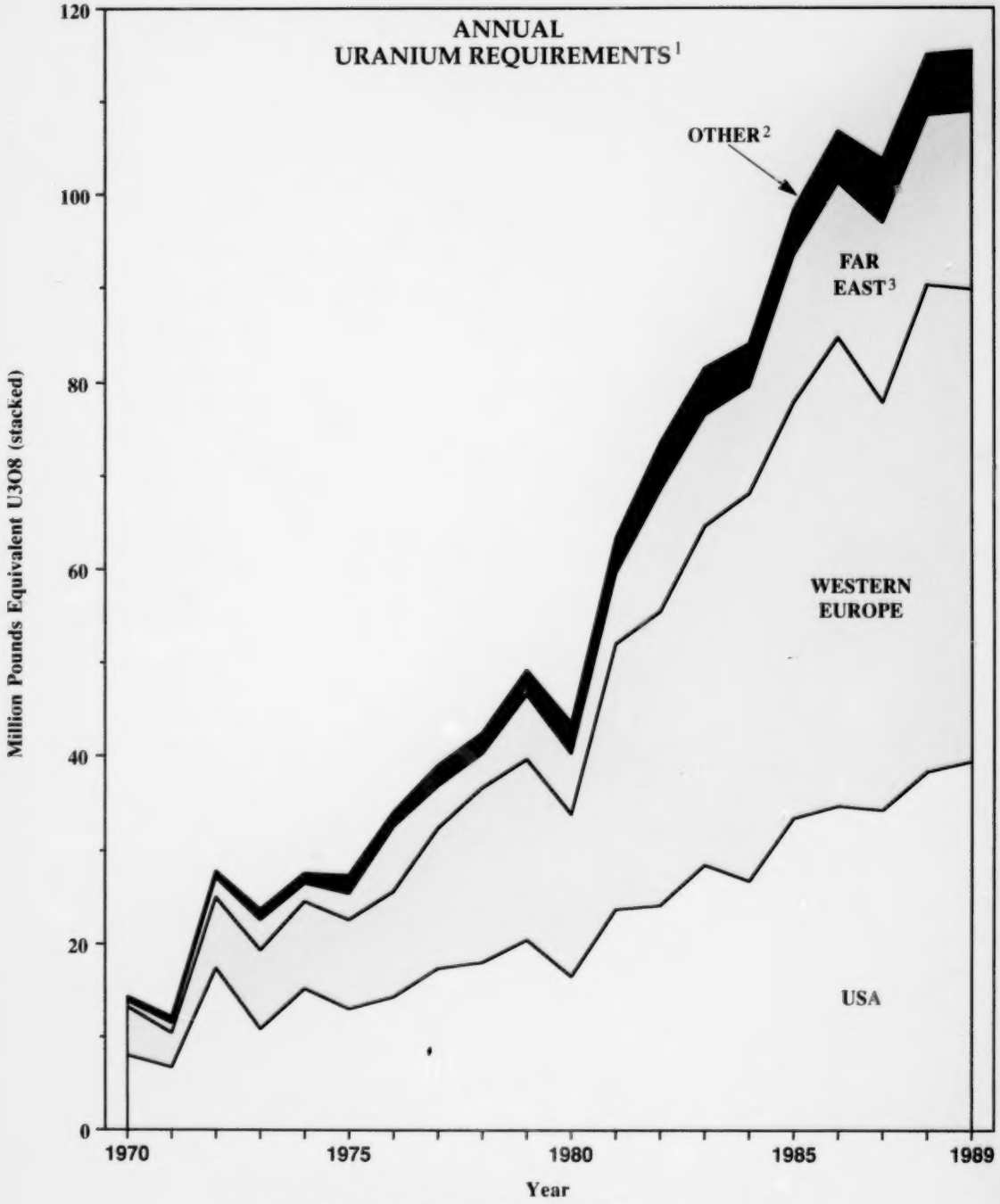
HISTORICAL MARKET DATA



[1] Calculated by NUEXCO based on actual completion dates and operating performance, and NUEXCO's estimate of enriching tails assays.

[2] **Other** include: Argentina, Brazil, Canada, India, Mexico, Pakistan and South Africa.

[3] Does not include Peoples Republic of China.

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AUSTRALIA

Year	Period[1]	Consumer Price Index[2] (1980/1981 = 100)	Price Index of Materials Used in Manufacturing Industry — All Groups[3] (1984/1985 = 100)	Average Weekly Ordinary Time Earnings — Adult Males — Australia[4] (Australian dollars)	Award Rates of Pay Indexes Australia - Adult Males In Mining Wage Earners, Weekly Rates[5] (June 1985=100)
1980	Avg.	95.8	83.1	—	140.8[6]
1981	Avg.	105.0	85.9	—	154.1[6]
1982	Avg.	116.7	89.0	—	174.9[6]
1983	Avg.	128.5	96.9	—	181.9[6]
1984	Avg.	133.6	98.0	—	194.4[6]
1985	Avg.	142.6	107.3	—	103.7
1986	Avg.	155.5	101.5	—	106.1
1987	Avg.	168.7	108.9	465.88	112.3
1988	Avg.	180.9	111.8	496.90	115.2
1989	Avg.	194.6	117.0	534.65	126.0
Jan	1990	—	119.2	—	128.1
Feb	1990	—	120.8	—	128.1
Mar	1990	204.1	121.5	—	128.3
Apr	1990	—	119.9	—	128.5
May	1990	—	118.9	—	128.8
June	1990	207.4	116.6	—	129.2
July	1990	—	116.4	—	129.4
Aug	1990	—	122.4	—	129.4
Sept	1990	208.9	128.2	—	129.6

P = Preliminary **R** = Revised since last month

[1] Monthly data for the period 1967 to 1986 appears in Report 233 (January 1988).
[2] Weighted average of six State capital cities (1975 to 1980), and eight capital cities from 1981 (Base: Financial year July 1980 to June 1981 = 100.0). Figures shown at end of quarter represent quarterly average.
[3] Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).
[4] Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.
[5] Australian Bureau of Statistics, Canberra: "Average Weekly Earnings, States & Australia" (Catalogue No. 6302.0).
[6] Base: June 1976 = 100.

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GOVERNMENT STATISTICS

CANADA

		Industrial Products Price Index: All Commodities [1] (1986 = 100) [2]	Consumer Price Index: All Items (1986 = 100) [3]	Wage-earner Data: Average Hourly Earnings (C$) [4]				
				Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells (SIC 051-099)	Metal Rolling, Casting and Extruding (SIC 298)	Chemicals and Chemical Products Industries (SIC 372-379)
1980	Avg.	75.7	67.1	—	—	—	—	—
1981	Avg.	83.4	75.5	—	—	—	—	—
1982	Avg.	89.0	83.7	—	—	—	—	—
1983	Avg.	92.1	88.5	17.22	—	14.18	10.67	11.10
1984	Avg.	96.3	92.3	17.89	—	14.97	11.11	11.68
1985	Avg.	99.0	96.0	18.53	16.48	15.56	11.85	12.12
1986	Avg.	100.0	100.0	19.38	16.70	15.76	12.28	12.58
1987	Avg.	102.4	104.4	20.12	17.15	16.11	12.58	13.20
1988	Avg.	106.9	108.6	20.91	18.51	16.95	13.17	13.77
1989	Avg.	109.4	114.0	21.97	20.02	18.41	13.71	14.16
Jan	1990	108.7	116.9	21.88	20.39	19.03	13.99	14.78
Feb	1990	109.3	117.6	22.51	20.63	19.14	14.49	15.03
Mar	1990	109.2	118.0	22.52	20.75	19.17	14.99	15.07
Apr	1990	109.1	118.1	23.17	21.20	19.46	14.83	14.93
May	1990	109.5	118.7	23.28	20.55	19.01	14.71	15.06
June	1990	109.4	119.2	21.85	20.63	18.96	14.69	15.05
July	1990	109.1	119.8	20.92	20.18	18.66	14.34	15.20
Aug	1990	109.2	119.8	23.88	20.51	18.59	14.50	15.33
Sept	1990	109.9	120.2	24.41 R	21.19 R	18.94 R	14.48 R	15.63 R
Oct	1990	110.3	121.2	23.11 P	21.16 P	19.04 P	14.77 P	15.45 P
Nov	1990	110.6	121.9	—	—	—	—	—

P = Preliminary **R** = Revised since last month

[1] Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Monthly data for the period 1967 to 1986 is found in Report 233.

[2] New Base Year of 1986 as of Report 266. Previous Base Year was 1981. All figures in column recalculated by 0.791 multiplier.

[3] New Base Year of 1986 as of Report 264. Previous Base Year was 1981. All figures in column recalculated by 0.755 multiplier.

[4] Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours." Monthly data for the period 1983 to 1986 is found in Report 233.

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SOUTH AFRICA

		Average Declared Working Costs per Metric Ton of Gold Ore Milled [1] (Rand)	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled [2] (March 1982 = 100)	Consumer Price Index [3] (1985 = 100)	Production Price Index All Groups [4] (1985 = 100)	Total Employment in Mining and Quarrying [5]	Total Salaries and Wages in Mining and Quarrying [5] (1,000 Rand)
							Annual Total [6]
1980	Avg.	35.53	—	51.9	55.2	709,042	2,237,689
1981	Avg.	41.89	—	59.8	62.7	722,918	2,756,928
1982	Avg.	47.25	104.2	68.6	71.4	702,041	3,181,584
1983	Avg.	51.88	115.0	77.1	79.0	700,901	3,563,282
1984	Avg.	58.95	130.3	86.0	85.6	711,511	4,134,390
1985	Avg.	68.76	151.6	100.0	100.0	724,587	4,778,612
1986	Avg.	80.22	177.9	118.6	119.5	756,637	5,767,950
1987	Avg.	95.01	223.1	137.7	136.2	751,864	6,911,395
1988	Avg.	106.69	241.1	155.4	154.1	705,355	7,774,054
1989	Avg.	116.65	273.0	178.2	177.5	700,360	8,833,934
							Monthly Total
Jan	1990	—	—	192.0	188.8	688,837	801,616
Feb	1990	—	—	193.3	190.3	674,026	767,274
Mar	1990	126.74	296.3	196.4	190.9	704,660	780,614
Apr	1990	—	—	198.3	194.1	696,107	810,474
May	1990	—	—	200.4	196.3	613,527	719,191
June	1990	128.25	299.87	201.8	197.0	676,621	841,165
July	1990	—	—	203.2	197.2	682,001	903,195
Aug	1990	—	—	206.5	199.8	686,385	902,392
Sept	1990	129.46	312.55	209.7	203.2	—	—
Oct	1990	—	—	211.1	206.1	—	—
Nov	1990	—	—	215.6	—	—	—

P = Preliminary **R** = Revised since last month

[1] Chamber of Mines of South Africa, Johannesburg: "Analysis of Working Results," published quarterly. Historical Data by month appears in Report 236.

[2] Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.

[3] Central Statistical Service, Pretoria: All income groups-weighted average, Historical Data by month appears in Report 236.

[4] Central Statistical Service, Pretoria: All commodities for consumption in South Africa.

[5] Central Statistical Service, Pretoria: Historical Data by month appears in Report 236.

[6] Annual total is shown, rather than monthly average, for indicated year.

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UNITED STATES

		Producer Price Index[1]		Consumer Price Index[2]	GNP Implicit Price Deflator[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
		Industrial Commodities (1982 = 100)	All Commodities (1982 = 100)	(1982-1984 = 100)	(1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980	Avg.	88.0	89.8	82.4	85.7	10.26	10.63	8.30	6.94
1981	Avg.	97.4	98.0	90.9	94.0	11.55	11.98	9.12	7.62
1982	Avg.	100.0	100.0	96.5	100.0	12.31	12.93	9.96	8.21
1983	Avg.	101.1	101.3	99.6	103.9	12.58	13.43	10.58	8.67
1984	Avg.	103.3	103.7	103.9	107.7	13.05	13.43	11.07	9.04
1985	Avg.	103.7	103.2	107.6	110.9	13.38	13.74	11.56	9.46
1986	Avg.	100.0	100.2	109.6	113.9	12.46	13.48	11.98	9.65
1987	Avg.	102.6	102.8	113.6	117.7	12.52	12.98	12.37	9.88
1988	Avg.	106.3	106.9	118.3	121.3 R	13.24	13.26	12.71	9.79
1989	Avg.	111.6	112.2	124.0	126.3 R	13.59	13.72	13.09	10.05
Jan	1990	114.1	114.9	127.4	—	13.69	13.95	13.34	10.13
Feb	1990	113.6	114.4	128.0	—	13.70	13.99	13.27	10.16
Mar	1990	113.2	114.2	128.7	129.5 R	13.80	14.04	13.34	10.17
Apr	1990	113.2	114.1	128.9	—	13.92	14.30	13.53	10.17
May	1990	113.5	114.6	129.2	—	13.96	14.16	13.46	10.22
June	1990	113.2	114.3	129.9	131.0 R	14.00	14.31	13.51	10.27
July	1990	113.4 R	114.5 R	130.4	—	14.29	14.49	13.58	10.34
Aug	1990	115.9	116.5	131.6	—	14.27	14.60	13.57	10.33
Sept	1990	118.3	118.3	132.7	132.2 R	14.41	14.48 R	13.62 R	10.42 R
Oct	1990	121.3	120.8	133.5	—	14.43 P	14.59 P	13.74 R	10.47 R
Nov	1990	120.6	120.1	133.8	—	—	—	13.79 P	10.52 P

P = Preliminary **R** = Revised since last month

[1] US Bureau of Labor Statistics, Washington, DC: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents. Historical data is presented in Report 233.

[2] US Bureau of Labor Statistics, Washington, DC: Consumer Price Index for All Urban Consumers, US City Average, All Items. Historical data is presented in Report 233.

[3] US Department of Commerce, Washington, DC: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted. Historical data is presented in Report 233.

[4] US Bureau of Labor Statistics, Washington, DC: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Historical data is presented in Report 233.

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US URANIUM MARKETING ACTIVITIES STATISTICS
(Compiled from data published by the US Energy Information Administration) [1]

Year	Total Production (million pounds U_3O_8)	Deliveries to Domestic Utilities From US Suppliers[2] (million pounds U_3O_8)	Average Price of Delivered Uranium[2] ($/lb. U_3O_8)	Quantity of Uranium Imported[3] (million pounds U_3O_8)	Average Price of Imported Uranium ($/lb. U_3O_8)	Quantity of Uranium Exported (million pounds U_3O_8)
1976	25.5	27.6	$16.10	3.6	n/a	1.2
1977	29.9	27.8	$19.75	5.6	n/a	4.0
1978	37.0	31.6	$21.60	5.2	n/a	6.8
1979	37.5	33.0	$23.85	3.0	n/a	6.2
1980	43.7	35.0	$28.15	3.6	$43.10	5.8
1981	38.5	32.6	$34.65	6.6	$32.90	4.4
1982	26.9	23.5	$38.37	17.1	$25.19	6.2
1983	21.2	24.2	$38.21	8.2	$26.16	3.3
1984	14.9	22.5	$32.65	12.5	$21.86	2.2
1985	11.3	21.7	$31.43	11.7	$20.08	5.3
1986	13.5	18.9	$30.01	13.5	$20.07	1.6
1987	13.0	20.8	$27.37	15.1 R	$19.14	1.0
1988	13.1	17.6	$26.15 R	15.8	$19.03	3.3
1989	13.8	18.4	$19.56	13.1	$16.75	2.1

P = Preliminary R = Revised since last month

[1] Sources: 1976-1983: US Department of Energy/Energy Information Administration, *Survey of United States Marketing Activity*
1984-1989: Energy Information Administration, *Uranium Industry Annual*

[2] Data for 1976-1981 includes both domestic utilities and agents

[3] Includes imports by domestic utilities and domestic suppliers

NUEXCO

GOVERNMENT STATISTICS

VOLUME AND PRICE OF URANIUM DELIVERIES TO THE EUROPEAN COMMUNITY[1]
(Compiled from data published by the Euratom Supply Agency)

Year	Volume of Deliveries to the EC[2] (MTU)	Percentage of Deliveries Made Under Spot Contracts	Medium or Long-Term Contracts[3] Average Price		Spot Contracts[3] Average Price	
			in ECU per pound U_3O_8	in US Dollars per pound U_3O_8	in ECU per pound U_3O_8	in US Dollars per pound U_3O_8
1977	n/a	n/a	n/a	n/a	n/a	$41.00
1978	n/a	n/a	n/a	n/a	n/a	$43.00
1979	10,000	n/a	n/a	n/a	n/a	$44.50
1980	8,600	n/a	n/a	$36.00	n/a	$35.00
1981	13,000	less than 10	n/a	$33.25	n/a	$28.00
1982	12,500	less than 10	ECU 32.25	$32.00	ECU 24.25	$24.00
1983	13,500	less than 10	ECU 34.75	$31.00	ECU 26.00	$23.25
1984	11,000	less than 10	ECU 37.75	$29.75	ECU 24.50	$19.25
1985	11,000	11.5	ECU 38.00	$29.00	ECU 19.50	$15.00
1986	12,000	9.5	ECU 31.50	$31.00	ECU 18.00	$17.75
1987	14,000	17.0	ECU 28.25	$32.50	ECU 15.00	$17.25
1988	12,500	4.5	ECU 26.92	$31.82	ECU 13.65	$16.13
1989	13,500	11.5	ECU 26.63	$29.35	ECU 11.04	$12.19

R = Revised

[1] The twelve European Community member nations are Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, and the United Kingdom; prior to January 1986, Spain and Portugal were not members of the EEC.

[2] The only deliveries taken into account are those made to final users, namely the electric utilities or their procurement organizations; deliveries to middlemen or fuel cycle companies are not included. The sales between utilities in the Community are also excluded. The quantities covered are those which were entered into accounting records during the year stated.

[3] For deliveries made under medium or long-term contracts (i.e., for which the time between the date of signature and the date of the last delivery exceeds one year) the prices were expressed in seven different currencies. In order to calculate an average price, these prices have been converted into European Currency Units (ECU) and US dollars. The average prices were weighted by quantity and converted on the basis of the average annual exchange rate of the different currencies against the ECU and US dollar. Exchange rates are published by European Communities Statistical Office and the International Monetary Fund.

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INTERNATIONAL ADVISORY COMMITTEE

J. Robert (Bob) Wolcott
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USA

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South Africa

Lars Halle
Sweden

James C.C. Stewart
United Kingdom

REPRESENTATIVES

JAPAN:

Kazuo Yokota
Japan Tech Services
Ohkura Building (3F)
1–4–10 Shiba Daimon
Minato-ku, Tokyo, Japan
Telephone: (81-3) 3431-6031, 6034
Telefax: (81-3) 3434-6674
Telex: 242-5060 (JATECH J)

SOUTH AFRICA:

Chris I. Von Christierson
Southern Prospecting (Pty) Limited
Mailing Address:
Post Office Box 61409
Marshalltown 2107
Republic of South Africa
Street Address:
7th Floor, Marshall Place
66 Marshall Street
Johannesburg 2001
Telephone: (27-11) 834-4211
Telefax: (27-11) 834-6343
Telex: 4-89878-SA

TAIWAN:

Dr. Steve H.K. Wang
Southeast Engineering Corporation
Yu-Ming Mansion
7, Roosevelt Rd., Sec. 1, 7th Floor
Taipei, 10757, Taiwan R.O.C.
Telephone: (886-2) 321-0216
Telefax: (886-2) 394-2621
Telex: 11285 (SENCORP)

UNITED STATES:

Harold C. Lindberg
83-A Hardee Lane
Whispering Pines, North Carolina 28327
Telephone: (919) 949-3622
Telefax: (919) 949-2526

Ralph O. Smith
141 Braemar Drive
Cheshire, Connecticut 06410
Telephone: (203) 272-6246
Telefax: (203) 271-1346

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